



The ISU Grand Challenge and the SOA Aspects in the EI Research Roadmap

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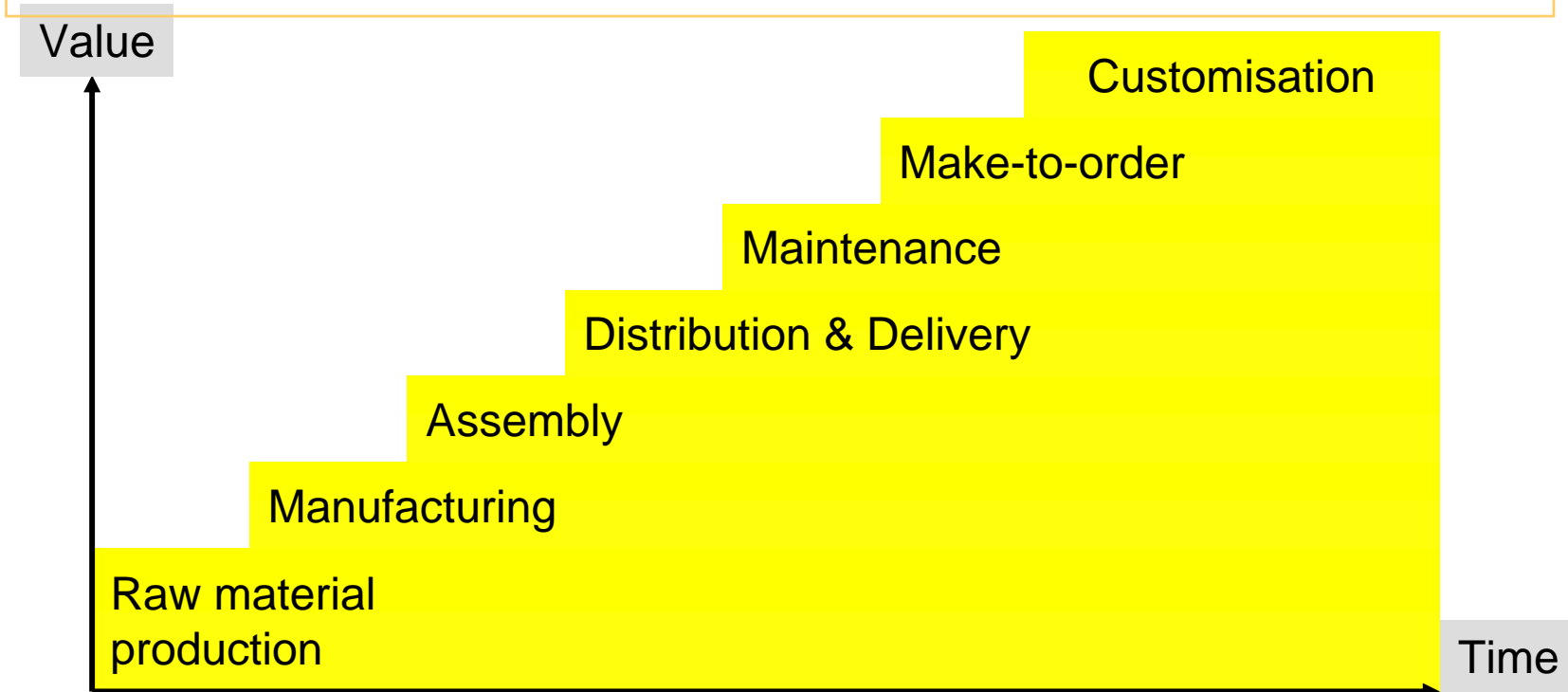
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Background: State of the Art in EI

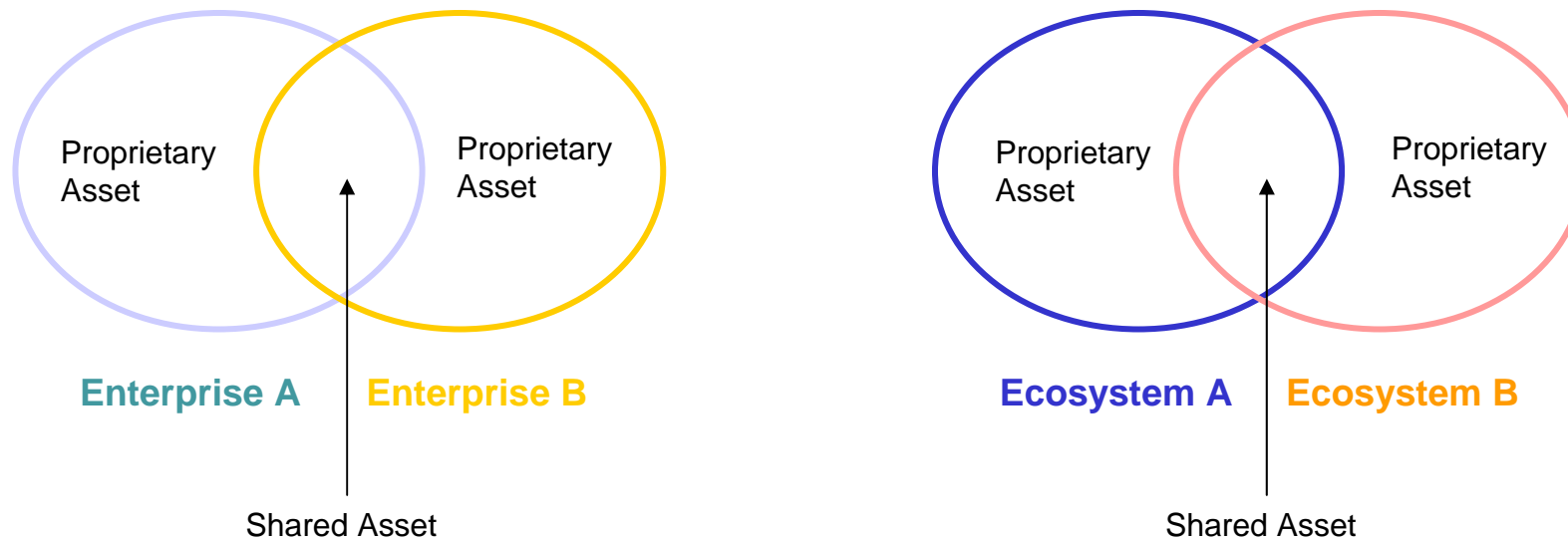
- Enterprise business relations – increasing cooperation
- Frameworks
- Sector specific specifications
- Service oriented computing and service oriented architectures - Web services, Grid services, and P2P services
- Commercial middleware solutions
- Semantic web services
- Domain ontology
- Modelling and notation languages
- Enterprise modelling
- Trust and contract management

Background: Processes



Historically, as processes become mechanised, their value decreases. Enterprises reap competitive advantage by moving up the stack and allocating resources to high-value processes.

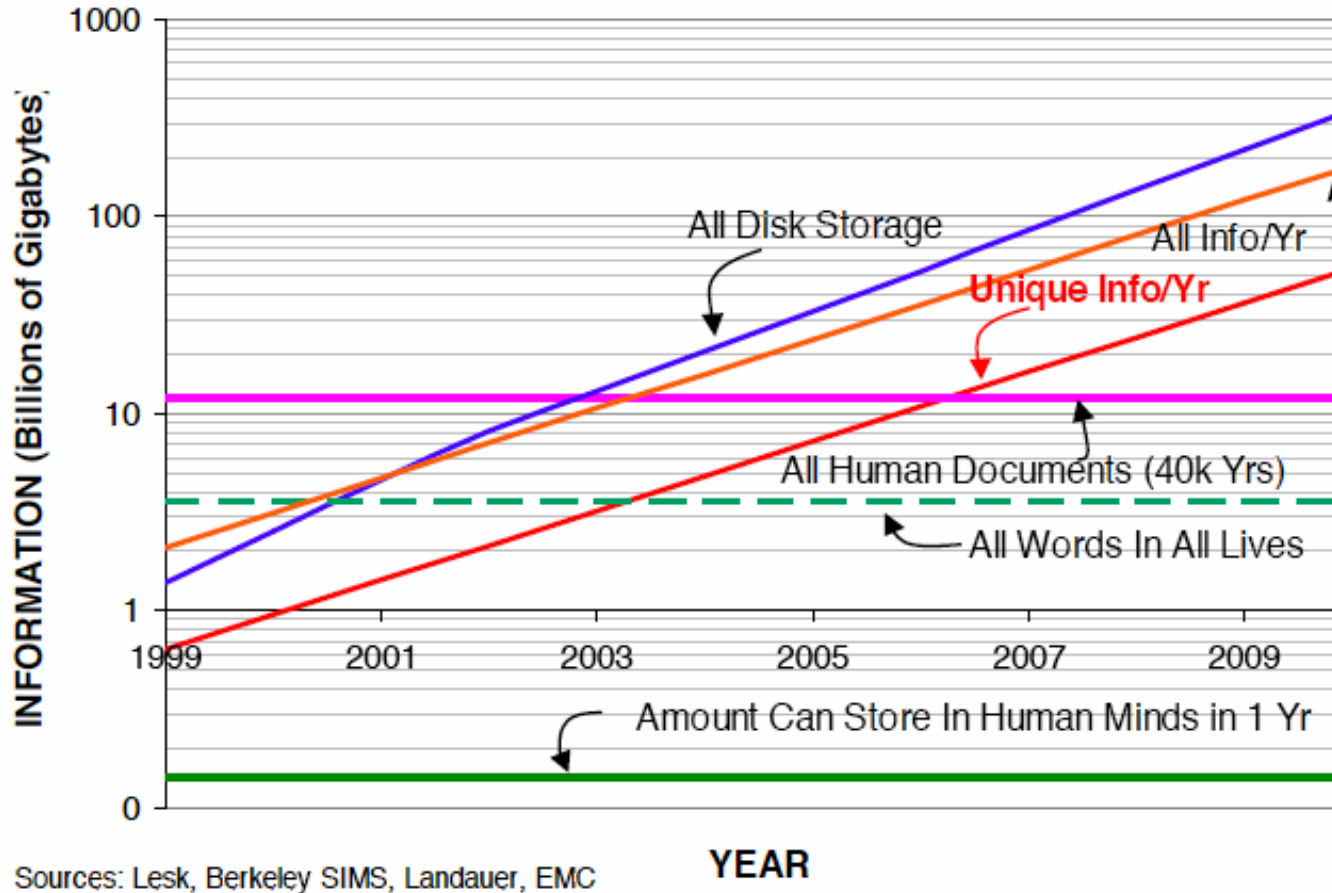
Background: Sharing & Innovation



More & more IT capabilities will increasingly become the *context* for business, not the *core* value for business

Enterprises as nodes in innovation ecosystems

Background: Information “Big Bang”



Quoted by Abhijit Deshmukh, NSF, International Consultation Workshop on EI Research, 21 March 06, Bordeaux

Interoperability Service Utility (ISU)

- Interoperability as a
 - utility-like capability for enterprises
 - a public good
- ISU as a basic infrastructure that supports
 - information exchange between knowledge sources, software applications and Web services
 - a new generation of self-* services and e-business services
 - connection between islands of interoperability
 - especially SMEs and start-up companies
- ISU is independent of, rather than an extension to, EI solutions on the market

ISU Infrastructure

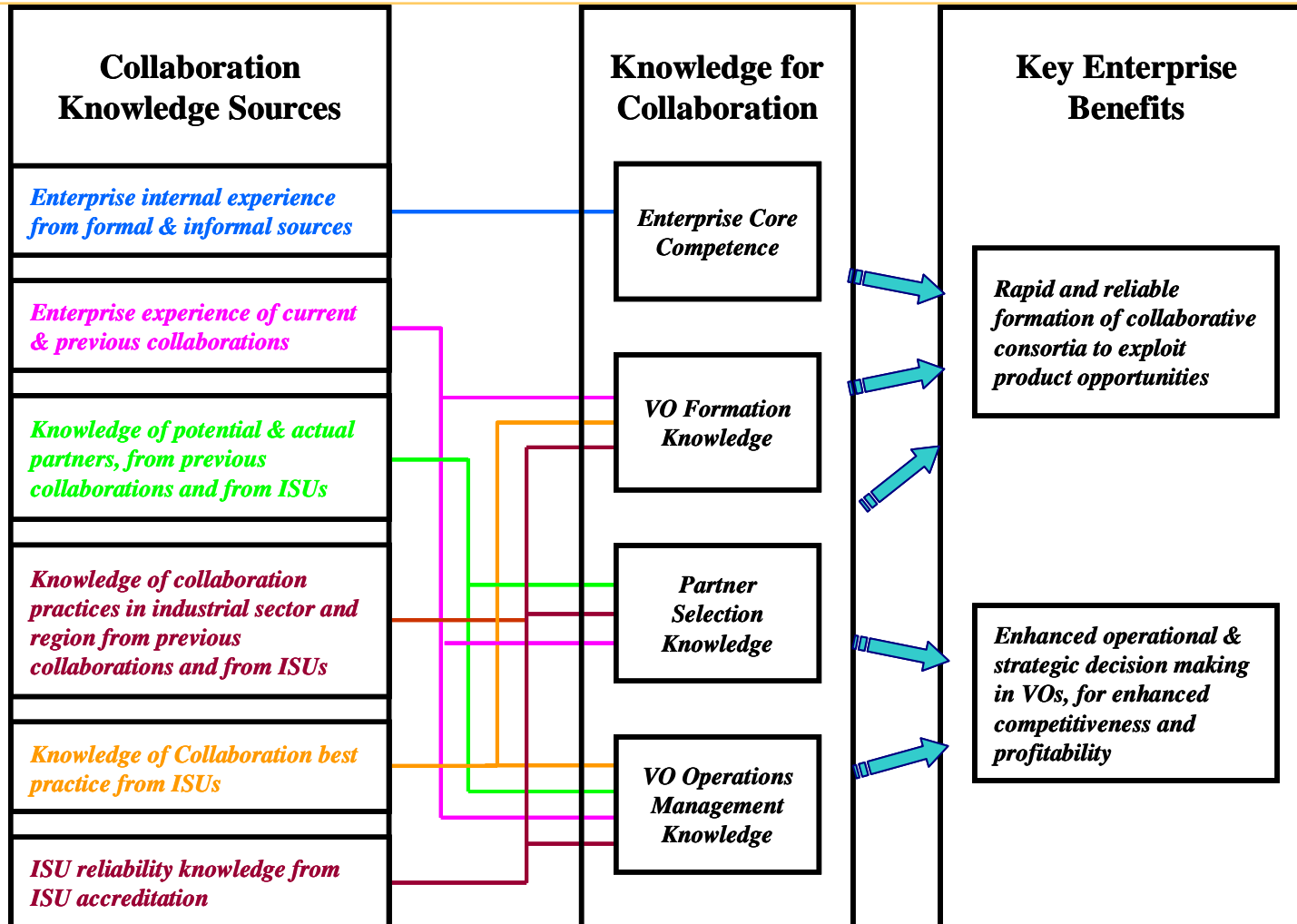
A basic information infrastructure that

- Has information objects, ontologies, and metadata repositories as its core
- Provides and guarantees basic information exchange over the Internet and the Web
- Provides transparent semantic reconciliation
- Is able to handle payload and message flow with a pre-defined level of quality of service

Potential ISU Services

- Facilitate real-time information sharing and collaboration between enterprises
- Enable a new generation of information-based applications with self-* properties
- Support knowledge creation, management, and acquisition for knowledge sharing
- Provide common e-business infrastructural capabilities
- Support the next generation of e-business services

Knowledge Oriented Collaboration



Web Technologies for EI

- EI Operating System enhancements to client-side applications
 - To develop solutions that raise the value of services offered by enterprises on the web platform, through more powerful technological capability of the software applications that they use
- Mash-up technology solutions for EI
 - To develop solutions characterised by the use of data and content available on the web, allowing enterprises to enhance existing services or offer new services where a part of the value added results from the use of this diverse data and content available on the web
- Web Service Logic Execution Environment (SLEE) for EI
 - To develop solutions enabling enterprises to request the execution of functions by remote web platform resources
- Web community solutions for EI
 - To develop solutions enabling enterprises to operate with others in subnets by using the web as a platform, while being assured that their intellectual property, knowledge, and the value that is created can be fully appropriated by the transacting entities

Example Research Challenges

- Semantics and ontologies
- Run time aspects of business processes
- Service discovery, brokering, negotiation and mediation
- Non functional aspects
- Role and context based privacy
- Intelligent supply chain processes
- Policy research challenges such as
 - implementation of e-commerce legislations
 - regulation of trusted certification authorities
 - exchange of data across national borders

ISU Design

- Premise: IT functionalities will be delivered as services that may reside anywhere and be invoked anytime
 - >> functional decentralisation, P2P communication, intelligent end-points
- Leverage open standards and specifications
 - >> modular software building blocks
 - >> exchange of information and knowledge that is meaningful to computers
- Transparency – “what goes in is what comes out”
 - >> addition of new services without changing the core
- A predictable and uniform environment for message transactions
 - >> definition of “minimum circumstances” and guarantee for transactions
- A system of systems
 - >> stable and reliable information propagation across multiple systems to end-points
 - >> inter-working with and transitioning from existing systems

ISU Business Case, Ownership, Regulation

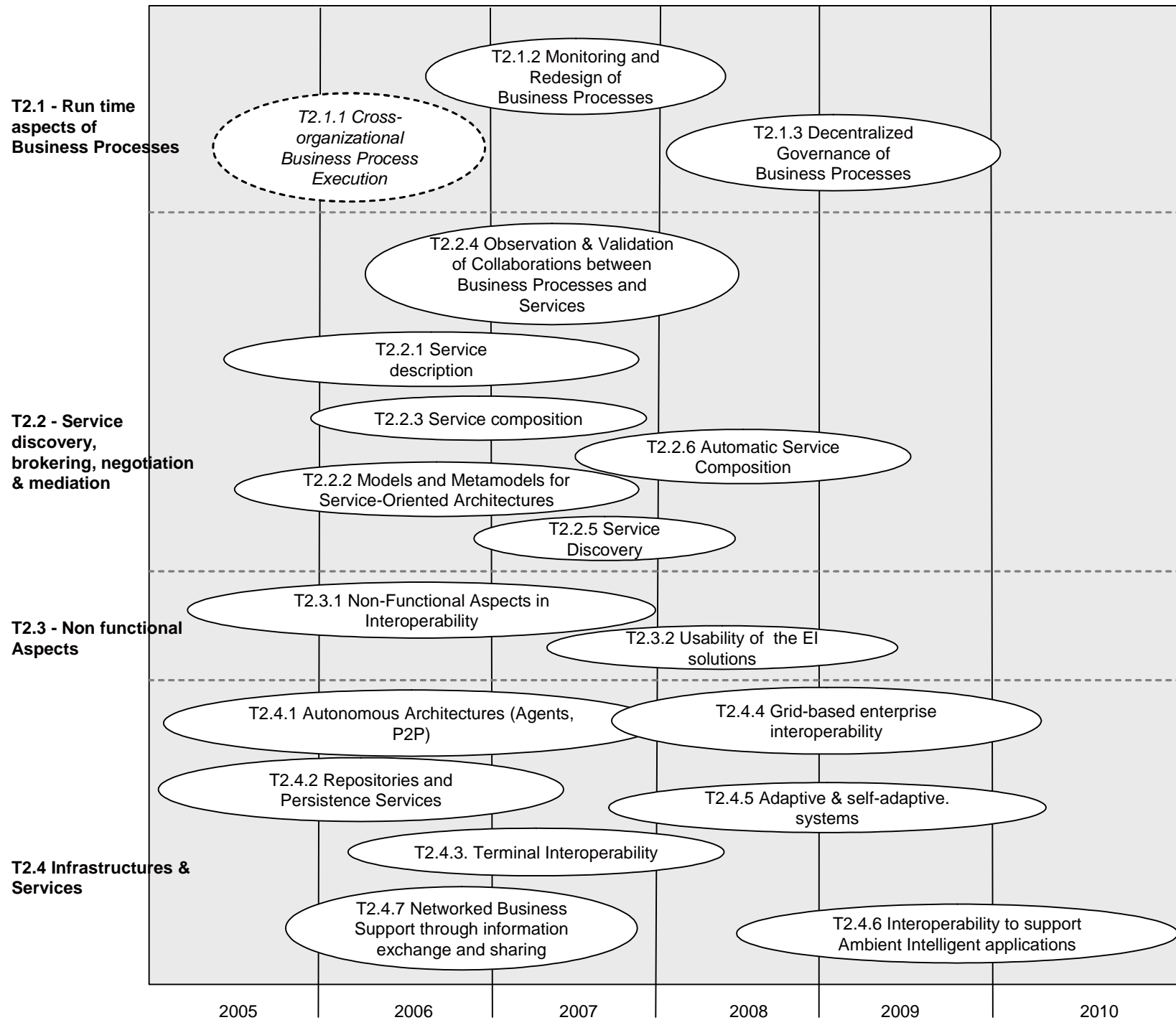
- How can enterprise interoperability be sold as a utility, rather than as an adjunct to a commercial offering?
- What would be a viable pricing model for technical functionality delivered as services?
- Who would be the business partners?
- What kind of partnership arrangements would be appropriate?
- Who would (should) own and/or operate the ISU?
- What would be the precise scope of operation and geographic coverage?
- What would be the appropriate governance model
- How should this model be decided upon, and by whom?
- What would be the legal status?
- Would it be appropriate to allow for and even foster competing ISUs?
- How would the ISU be regulated and by whom?

Indicative Technical Research Challenges in EI domain

- Enterprise (business/knowledge)
- ICT systems and Architecture & Platform
- Methodology
- Semantics and Ontology
- Generic Modelling

ICT Systems and Architecture & Platform Research Challenges

- Interoperability at ICT Systems level is the ability of an enterprise's ICT systems to cooperate with those of other, external organisations
- ICT solutions that allow an enterprise to operate, make decisions, exchange information within and outside its boundaries
- Interoperation between enterprise resources
- Supply of information through inter- and intra-system communication to enable cooperation between humans, machines and software programs
- Overall execution of the enterprise application orchestrated by the business process model identified in the enterprise view and formally (unambiguously) represented and stored in the ICT view
 - “Software applications have demonstrated lately that they are becoming a critical source of rigidity, both internally and externally”
 - Promising technologies: software component approach, Web Services (WSDL), enhanced search engines



Question 1:
What is the problem?

Question 2:
How is it going to be solved, and by who?

Question 3:
Is SOA the future?