

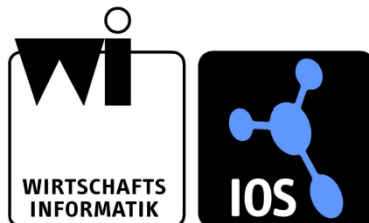


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Inter-Organizational Systems Introduction



Agenda

A. Course theme, outline and goals

B. Course organization

The Network Economy

The new economy is often referred to as the Information Economy, because of information's superior role (rather than material resources or capital) in creating wealth. I prefer the term Network Economy, because information isn't enough to explain the discontinuities we see. ... all the most promising technologies making their debut now are chiefly due to communication between computers - that is, to connections rather than to computations. And since communication is the basis of culture, fiddling at this level is indeed momentous. ...

We are now engaged in a grand scheme to augment, amplify, enhance, and extend the relationships and communications between all beings and all objects. That is why the Network Economy is a big deal.

The Network Economy is not the end of history. Given the rate of change, this economic arrangement may not endure more than a generation or two. Once networks have saturated every space in our lives, an entirely new set of rules will take hold.

(Kevin Kelly, in: Wired 5.09)

Technology and the Transformation of Industrial Organization

"Thus, an understanding of the specific technologies of production and distribution is essential to understand the reasons underlying the transformation of industrial organization in the late nineteenth and early twentieth century. Different technologies brought different scale economies and distribution needs."

Chandler, Alfred B.: Technology and the Transformation of Industrial Organization, 1987, 80

Technological challenges

Enterprise networks

- Networks of companies, e.g. supply chains, outsourcing
- Networking within companies, e.g. virtual teams
- Various forms of collaboration

- **ICT**
- Interorganisational systems
- eBusiness
- Communication systems and infrastructures

Enabling technologies

Economists' questions ...

"Coase's question was pathbreaking because it recognized that among the fictions of abstract classical economics, the one depicting economic agents as always acting alone rather than in cooperation with others in a defined social unit was especially intolerable, and had to be overcome if a **powerful theory of economic organization** were to be constructed. ... This question is similar to Coase's, but takes firms rather than individuals as the object of inquiry, asking **why it is that in every known capitalist economy, firms do not conduct business as isolated units, but rather form cooperative relations with other firms, with social boundaries of variable clarity around such relations.**"

Granovetter: Business Groups, 1994

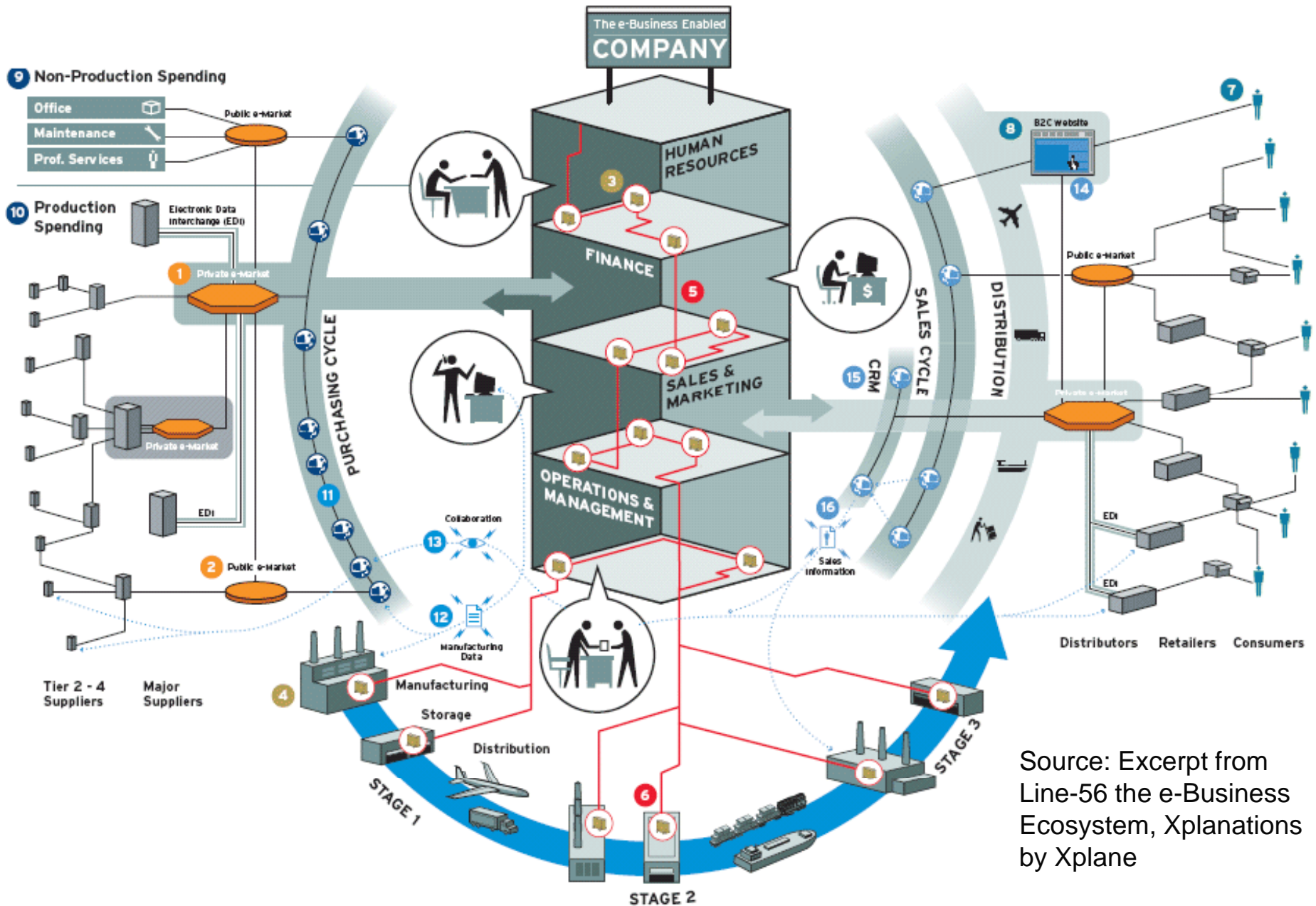
A line of reasoning (1/2)

- **Networks have become an ubiquitous form of organising**
 - ... across all parts of society, e.g. neighbourhood networks, the Mafia, or international political or military alliances.
 - However they are by no means new phenomena. The Hanseatic League is a medieval example of a trade network.
- **In light of hugely diverse network arrangements (comparable to the diversity in firms), a classification of networks is necessary**
- **The „New Economy“ has been seen as a major driver for increased networking**
 - Technology is increasing network effects (externalities)
 - and has transformed and created markets on a global scale.

A line of reasoning (2/2)

- **Collaboration and networking seem to be a promising strategic option**
 - *“An outbound manoeuvre: controlling the complexity of the environment ...*
 - *an inbound manoeuvre: augmenting the organizational capabilities. ...”* Ciborra (1992), Innovation, Networks and Organizational Learning, 96
- **But networks are precarious organisational arrangements**
 - they are inherently unstable, hybrid, underorganised arrangements
- **One response is to emphasize a diligent network management**
 - Specific network management challenges need to be identified
- **The focus throughout this course will be on ICT enabled forms of networking**
 - technology fits right into the structural characteristics of networks as communication rich environments.

The Business Ecosystem



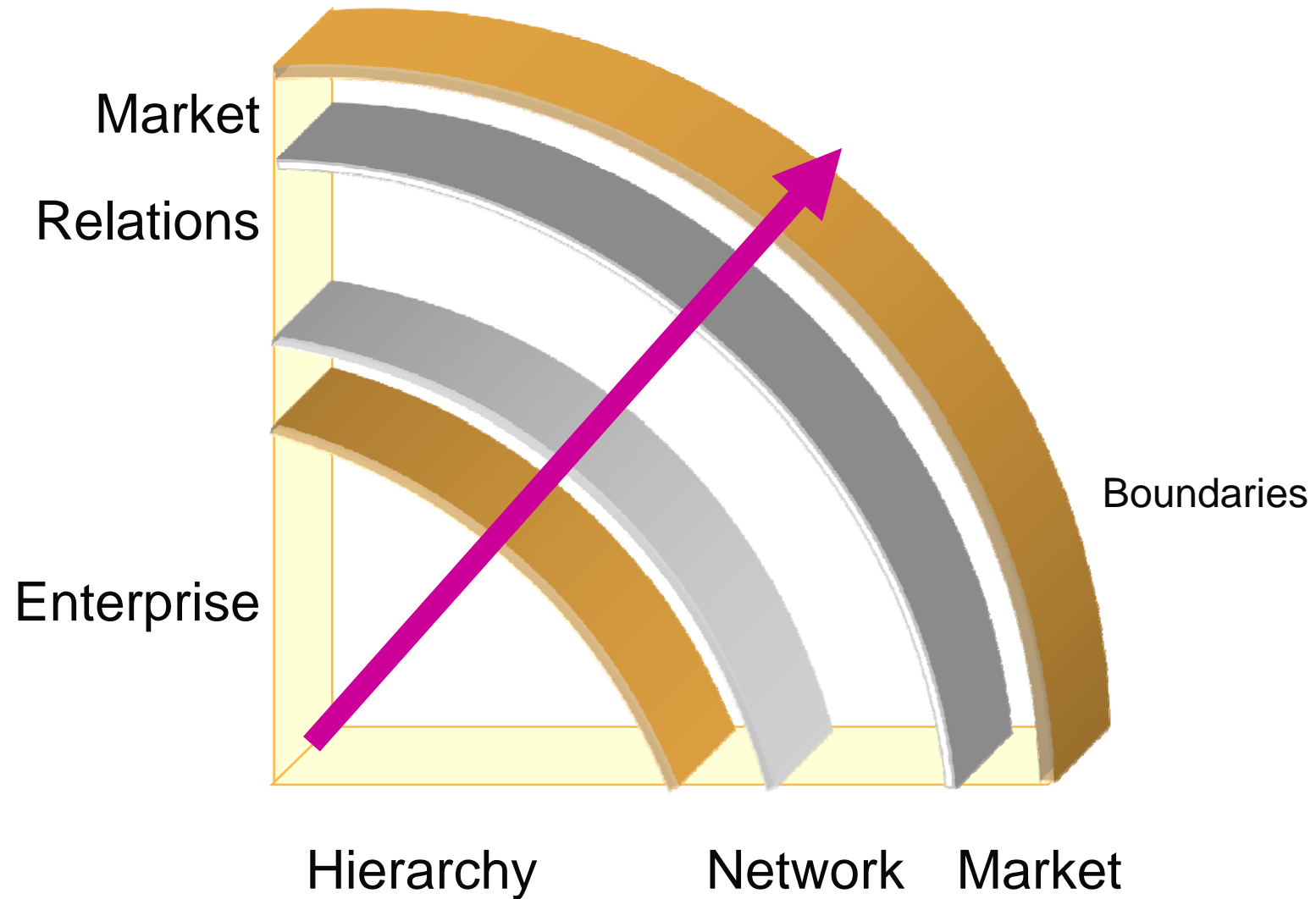
Source: Excerpt from Line-56 the e-Business Ecosystem, Xplanations by Xplane

Business is changing ...

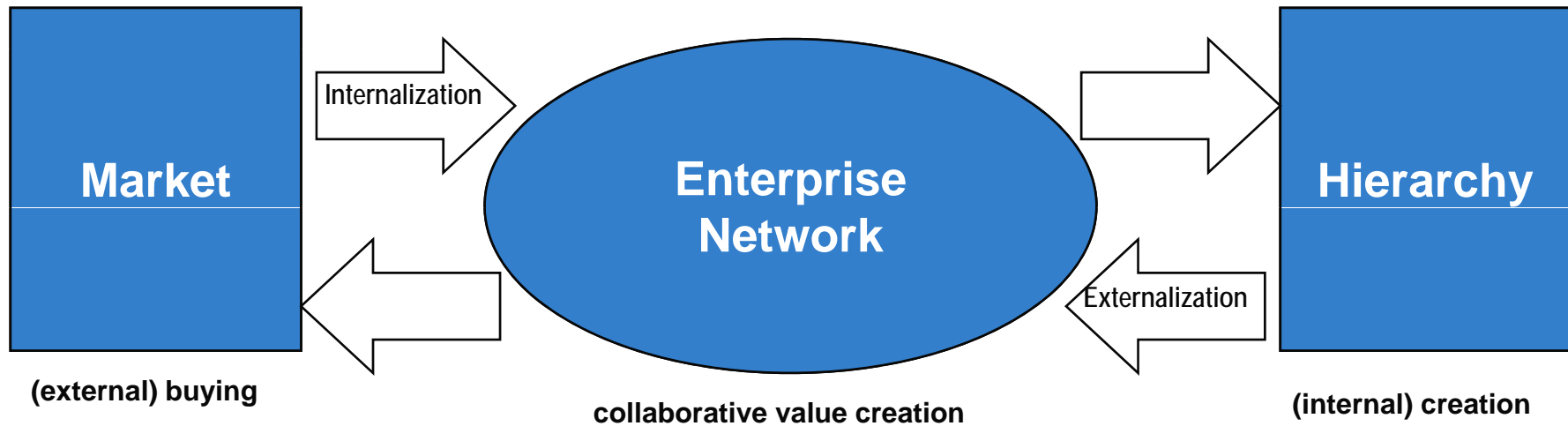
- **New products** and services are becoming commercially viable.
- **Methods for organizing** and running companies are evolving.
- **New relationships** are characterizing interactions among companies, their customers, suppliers, partners, and competitors.
- **Political, social, and economic change** is affecting the business climate on global, national, and industrial levels.
- All of this change is influenced by the cost, functionality, and availability of **computers, networking, and telecommunications**.

(from a recent call for contributions for the International Journal for Electronic Business)

The extended enterprise: crossing companies' boundaries



Networks - Between markets and hierarchies



A definition

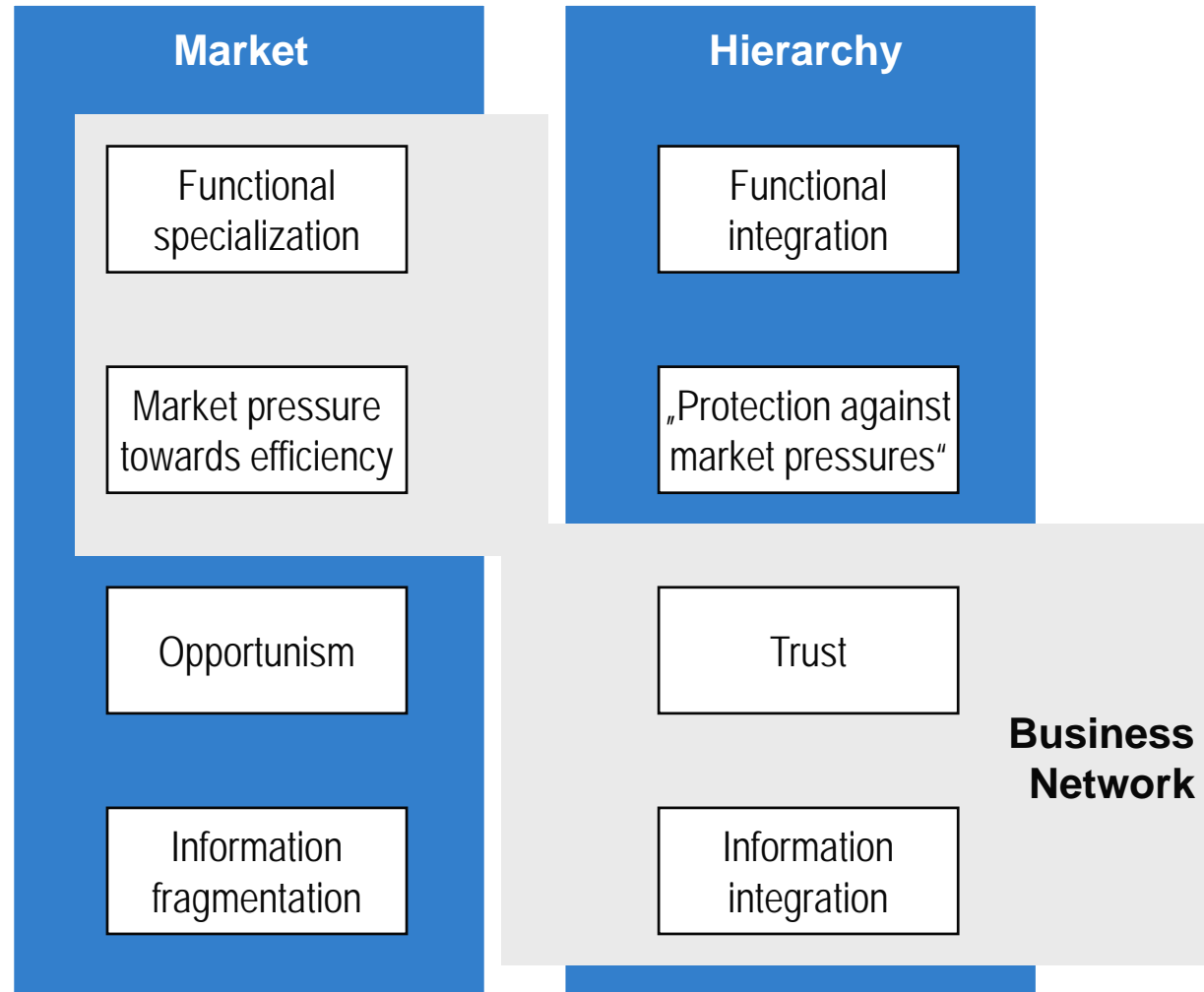
"Corporate networks are a long-term arrangement among distinct but related for-profit organisations. As such, they are an organisational form between markets and hierarchies.

Compared to markets, a network has more structure, produces more interaction among the network organisations, provides 'thicker' information channels, demands more loyalty, exhibits more trust, prefers voice to exit, and puts less emphasis on prices.

If **compared to hierarchies**, a network is somewhat underorganised, due to the loose coupling of the network organisations and due to the open boundaries of the network itself."

Sydow; Windeler 1993, 193

Characteristics of business networks



The claim ...

- IOS are a crucial part of the network economy
- They exhibit the underlying principles of the network economy

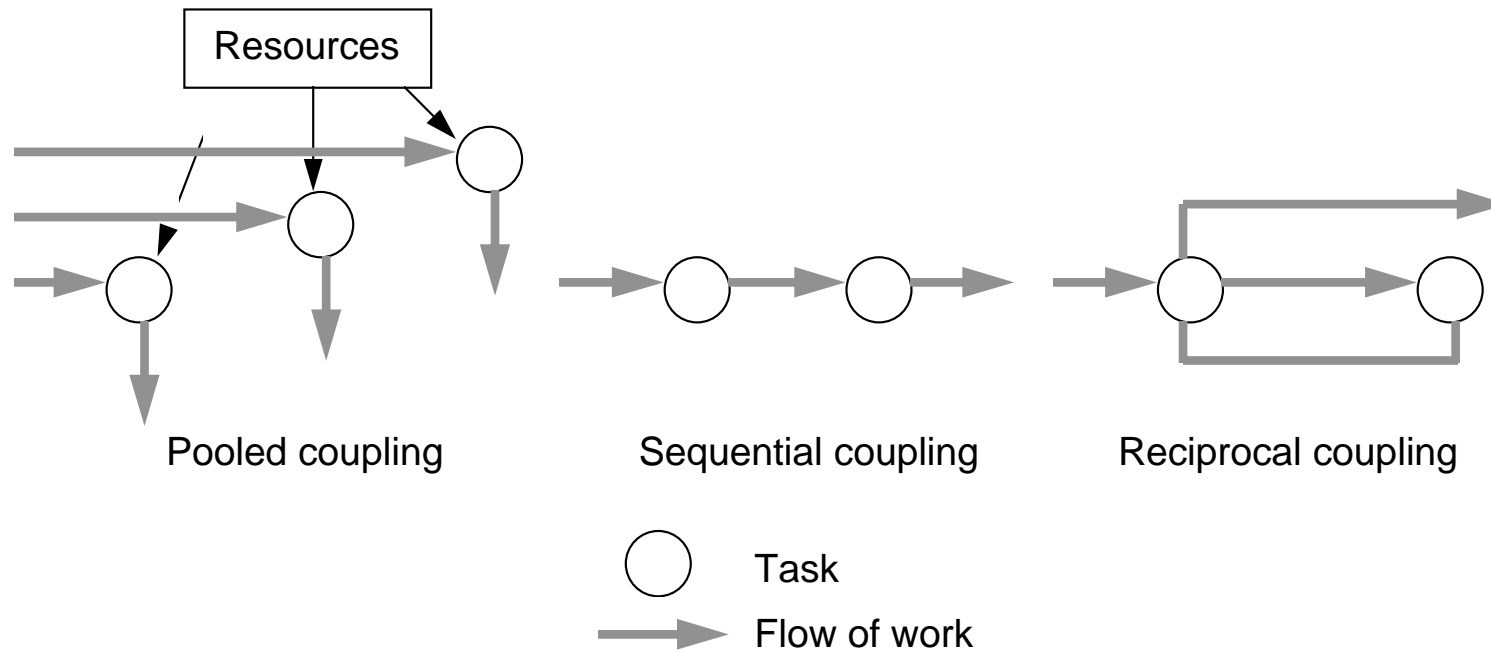
A trend towards networking, partnering ...

- **Blurring boundaries** of firms
- **Partnering** as alternative to Mergers and Aquisitions
- The emergence of **networked organizations**, e.g. virtual organizations, value webs, value nets etc.
- The proliferations of global **ICT-based infrastructures**, e.g. SWIFT

The trends point to two organizational phenomena

- **Specialization**, focus on core competencies, division of labour
- Interorganizational **cooperation and coordination**, e.g. supply chain management

Understanding (different modes of) dependencies



Mintzberg, 1979:23, based on Thompson, 1967

... but also to technical aspects

- Global ICT infrastructures
- Standards and protocols, e.g. EDIFACT, XML ...
- Distributed applications

A few questions ...

- IOS are heterogeneous (-> classification) and precarious (-> management) organizational forms
- What is the economic (-> transaction cost) and strategic rationale for IOS?
- How can they be built and operated (-> organization and ICT)?
- How do they emerge? Are they organizationally, strategically or technologically driven?
- What is the relationship between organizational and technical drivers?
- What are determinants and contingencies (-> industry, market structure) for design and success?

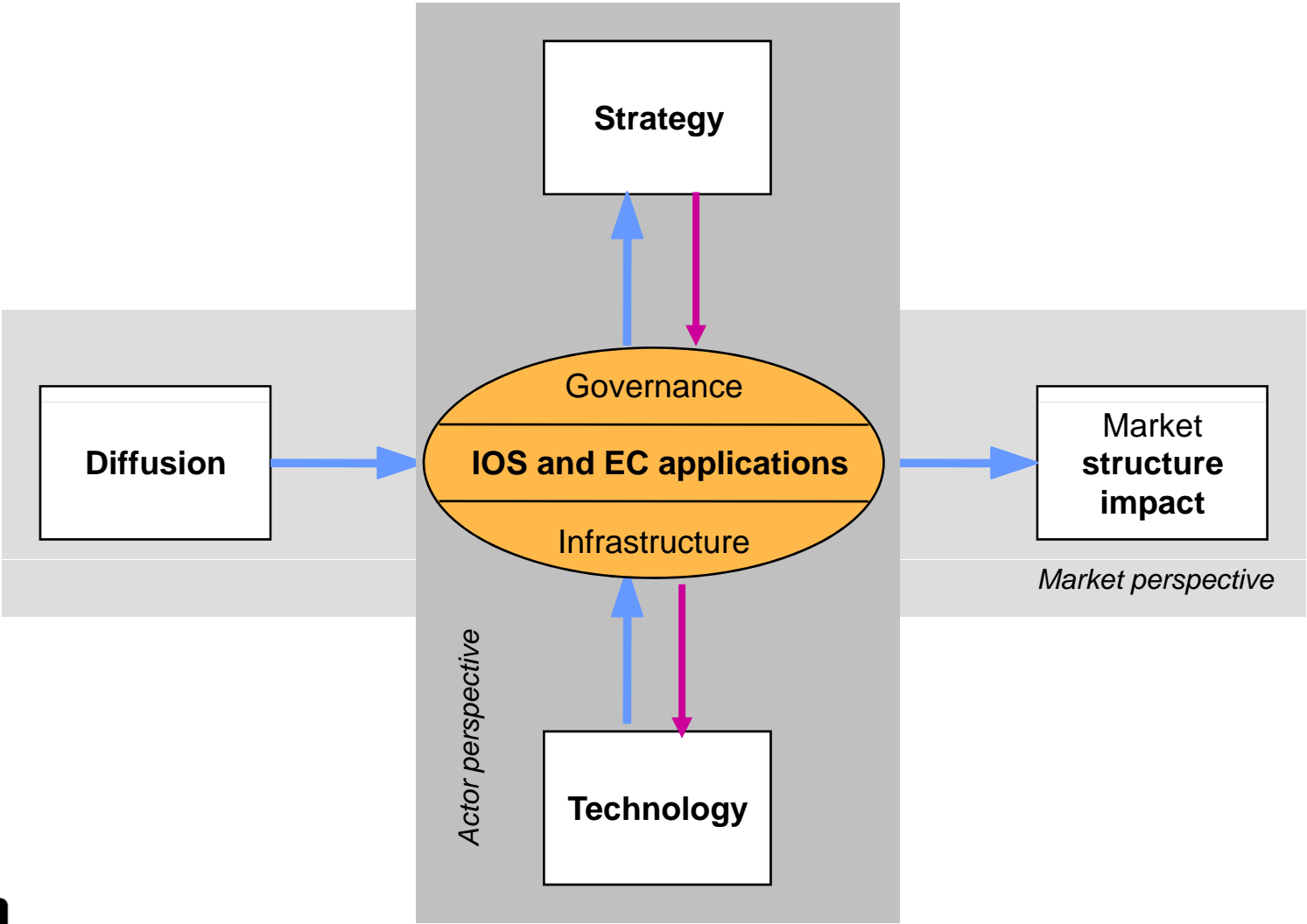
Perspectives on IOS

- **The historian:** The development of IOS within the context of industrial transformation
- **The organizational theorist:** theoretical explanations for the interrelationship between IOS and industrial organization
- **The manager:** evaluation of IOS embedded in the coordination strategy, managing interdependencies
- **The builder:** building blocks of IOS and the process of implementation

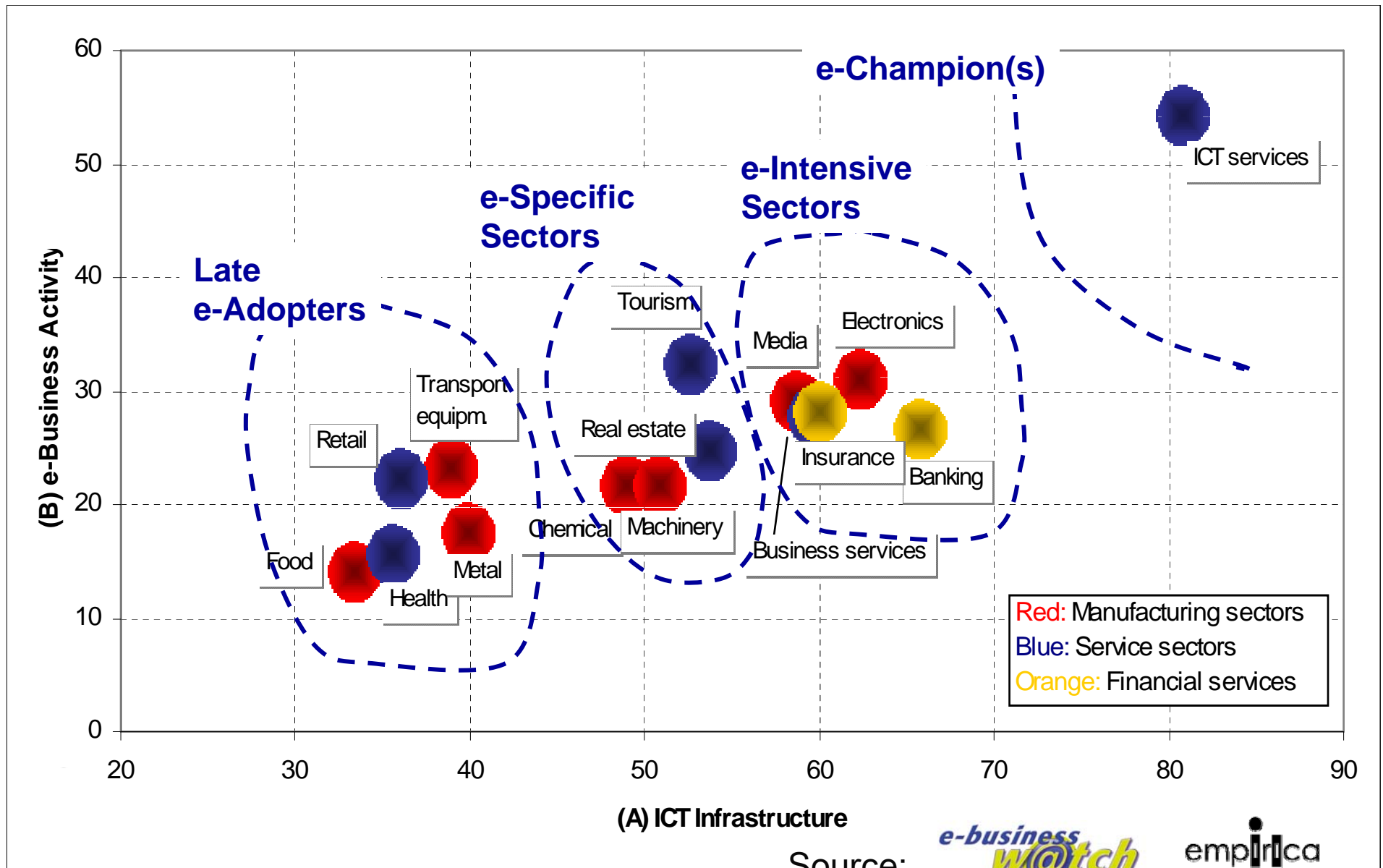
Views and perspectives

- Actors and markets
- The context: economic layers

The role of technology



Diffusion and impact of e-Business



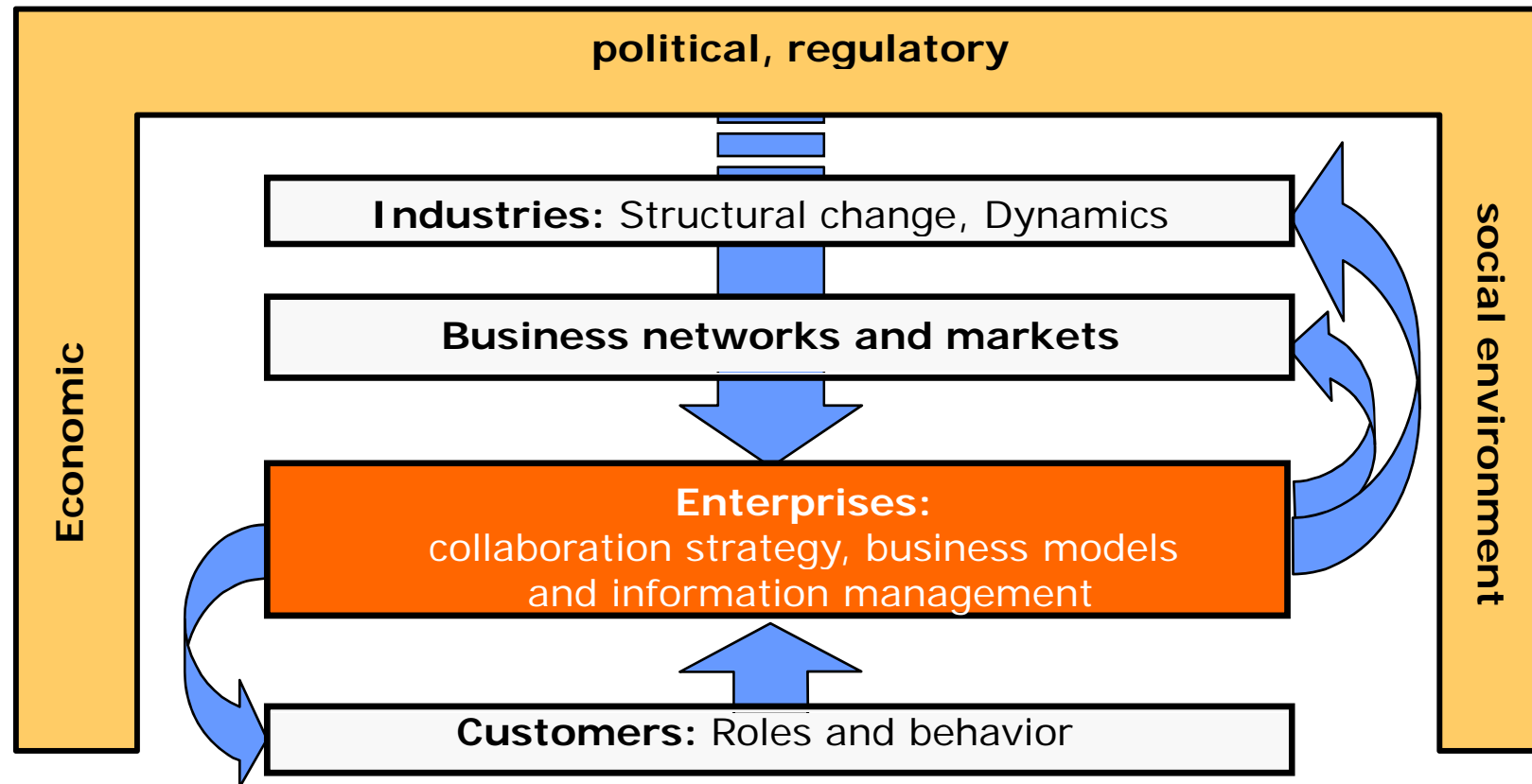
The context (1)

The New Competition - the dialectic of cooperation and competition as a foundations of international competitiveness (Best 1990)

the firm	"cooperation alone can ensure that commitments are made to the long-term infrastructural development of a sector; competition alone can ensure that business enterprises remain innovative and responsive to new challenges and opportunities." <i>Best: The New Competition, 19</i>
the pro chain	
the sec	
	enforce individual responsibility to the common interest
the govern	strategic industrial policy

"Firms form partners for the dance but, when the music stops, they can change them. In these circumstances competition is still at work even if it has changed its mode of operation." (Richardson 1972, 896)

The context (2)



European eBusiness Policy

What is eBSN?

In its conclusions on the impact of the e-economy on the competitiveness of European enterprises of 6 June 2002, the Industry Council invited the Member States and the Commission to *"intensify dialogue, exchange regularly experience, identify specific goals for e-business policies and to share best practices"*.

In response, the [eEurope 2005 Action Plan](#), as adopted by the Commission on 28 May 2002 and endorsed by the European Summit in Seville on 21 June 2002, foresees the establishment of *"an European e-business support network, federating existing European, national and regional players in this field with a view to strengthening and co-ordinating actions in support of SMEs in the field of e-business"*.

Facing the challenge of the new economic situation and with the vision of strengthening dialogue between different e-business initiatives at European level, the European Commission established the European e-Business Support Network for SMEs (eBSN). *The main objective of eBSN is to federate e-business experts in Europe and to share experience and good practice in support of e-business for SMEs*

http://ec.europa.eu/enterprise/e-bsn/index_en.html

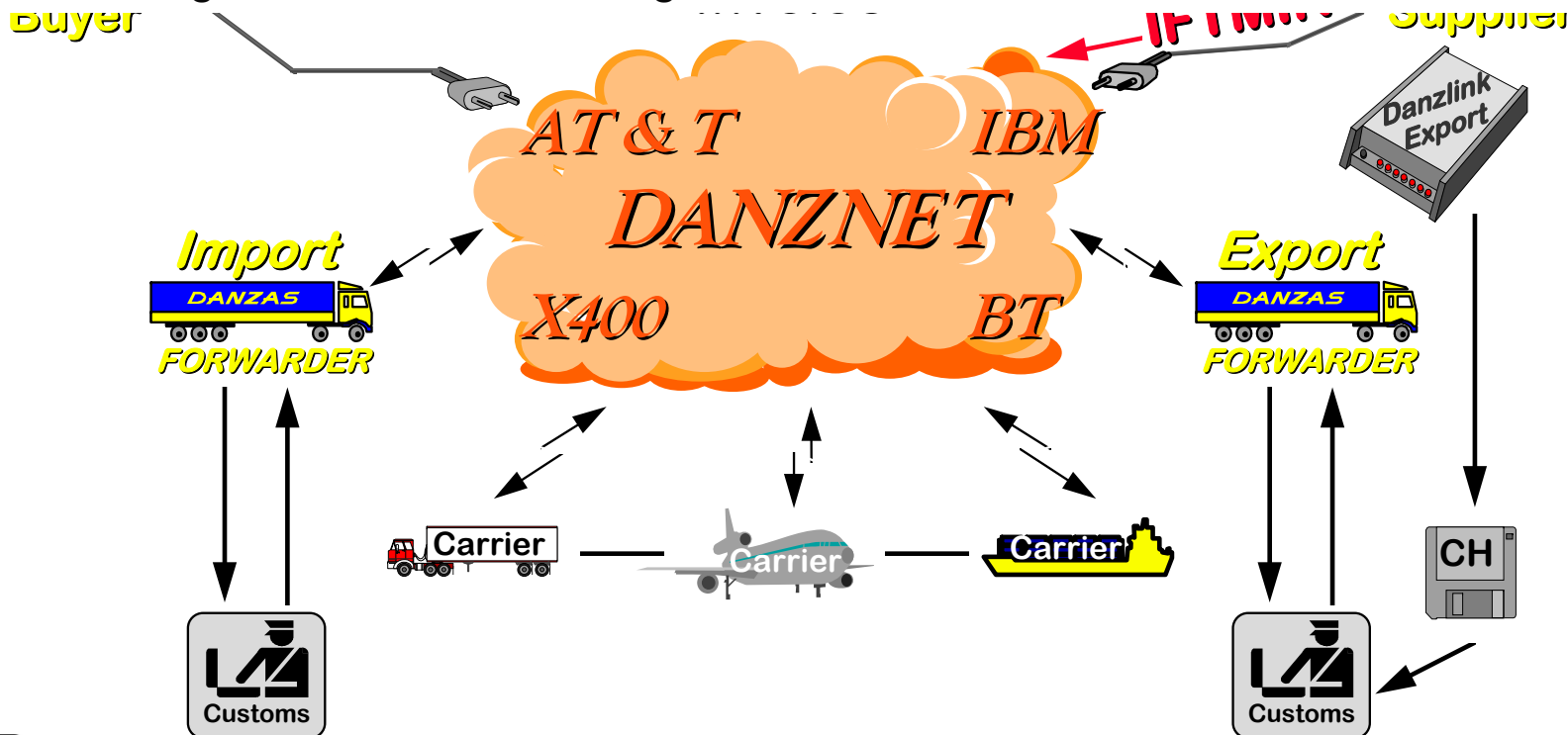
Part II: Inter-organisational Systems

- Information and communication technology for the extended enterprise

Example: DanzLink

Building on the electronic exchange of structured business messages (electronic data interchange - EDI), transport related messages (including the customs declaration) were included in a software package, which was sold at a subsidized price to Danzas customers.

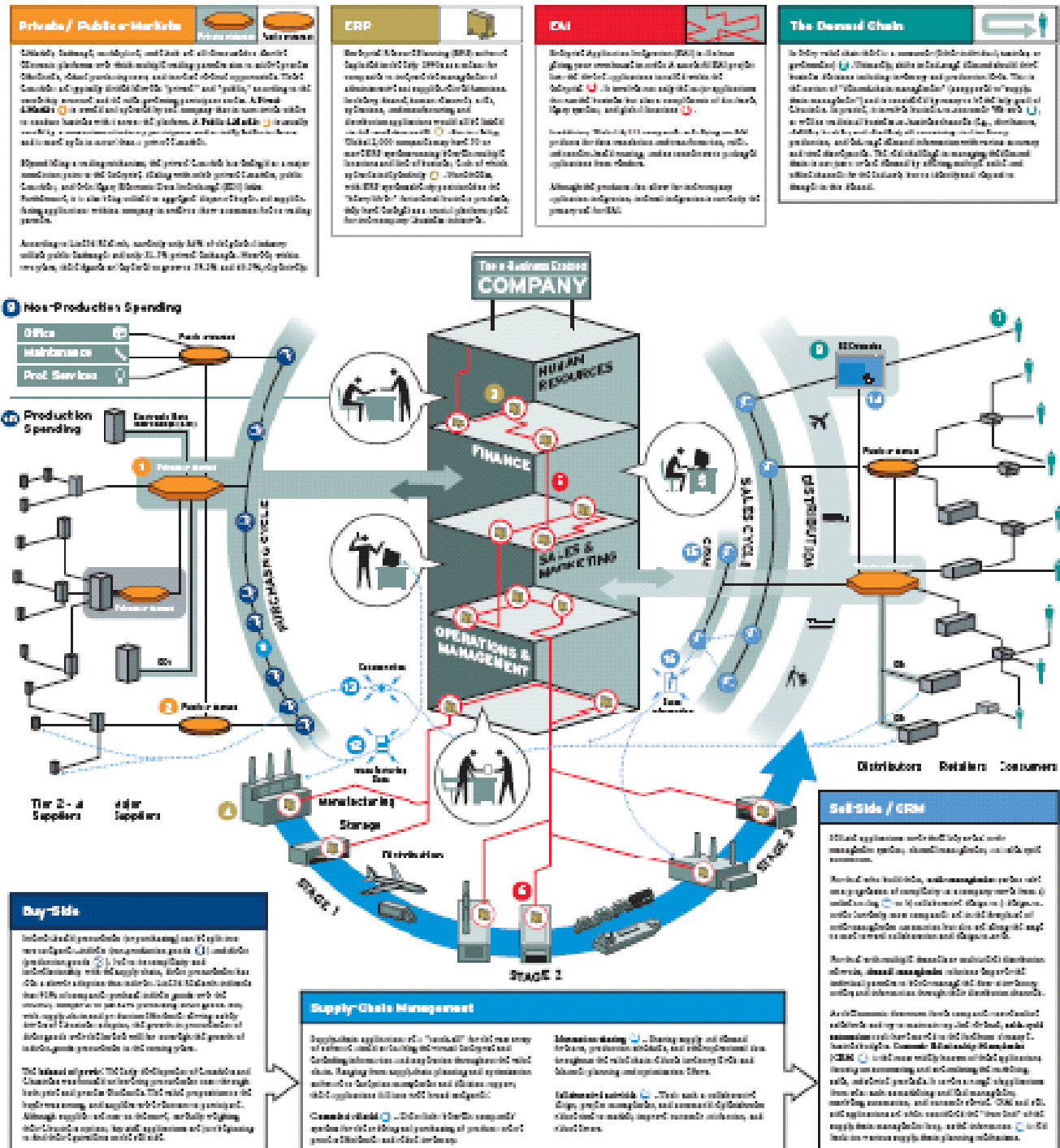
A license was given to the Swiss freight forwarders association.



Source: Danzas AG

The eBusiness Ecosystem

... driven by ICT applications



Source: Line-56 the eBusiness Ecosystem, explanations by Xplane

ICT applications ...

Private / Public e-Markets



e-Market, exchange, marketplace, and e-hub are all terms used to describe electronic platforms over which multiple trading partners aim to achieve process efficiencies, reduce purchasing costs, and increase revenue opportunities. These e-markets are typically divided between "private" and "public," according to the ownership structure and the rules governing participant access. A Private e-Market ① is owned and operated by one company that in turn invites others to conduct business with it across the platform. A Public e-Market ② is usually owned by a consortium of industry participants and/or independent investors and is more open in nature than a private e-market.

Beyond being a trading mechanism, the private e-market has emerged as a major connection point to the enterprise, dealing with other private e-markets, public e-markets, and even legacy Electronic Data Interchange (EDI) links. Furthermore, it is also being utilized to aggregate disparate buyer- and supplier-facing applications within a company in order to show a common face to trading partners.

According to Line56 Research, currently only 34% of the general industry utilizes public exchanges and only 31.5% private exchanges. However, within two years, these figures are expected to grow to 59.2% and 60.5%, respectively.

ERP



Enterprise Resource Planning (ERP) software exploded in the early 1990s as a means for companies to integrate the management of administrative and supplier-related functions. In theory, finance, human resources, sales, operations, and manufacturing and distribution applications would all be linked via the same data model ③. But in reality, Global 2,000 companies may have 30 or more ERP systems running between multiple locations and lines of business, each of which operates independently ④. Nonetheless, with ERP systems already positioned as the "heavy lifters" for internal business processes, they have emerged as a crucial platform piece for intercompany e-business initiatives.

EAI



Enterprise Application Integration (EAI) is all about getting your own house in order. A successful EAI project links the diverse applications installed within the enterprise ⑤. It involves not only the major applications that run the business but also a complex mix of databases, legacy systems, and global locations ⑥.

In addition, Global 2,000 companies are relying on EAI products for data translation and transformation, rules- and content-based routing, and as connectors to packaged applications from vendors.

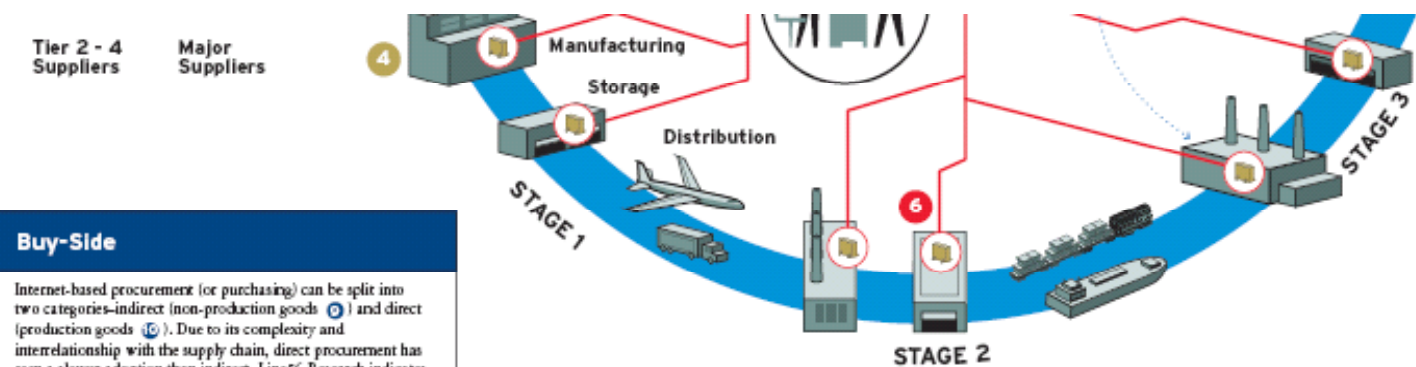
Although the products also allow for intercompany application integration, internal integration is currently the primary use for EAI.

The Demand Chain



In every value chain there is a consumer (either individual, business, or government) ⑦. Ultimately, shifts in end-stage demand should drive business decisions, including inventory and production levels. This is the notion of "demand-chain management" (as opposed to "supply-chain management") and is considered by many to be the holy grail of e-business. In practice, it involves business-to-consumer Web sites ⑧, as well as traditional business-to-business channels (e.g., distributors, resellers, brokers, and retailers), all containing vital inventory, production, and end-stage demand information with various accuracy and time discrepancies. The real challenge in managing the demand chain is not just to create demand by offering multiple online and offline channels for the end-user, but to identify and respond to changes in this demand.

The e-Business Enabled



Buy-Side

Internet-based procurement (or purchasing) can be split into two categories—indirect (non-production goods ⑨) and direct (production goods ⑩). Due to its complexity and interrelationship with the supply chain, direct procurement has seen a slower adoption than indirect. Line56 Research indicates that 91% of companies purchase indirect goods over the Internet, compared to just 42% purchasing direct goods. But, with supply-chain and production efficiencies serving as key drivers of e-business adoption, the growth in procurement of direct goods over the Internet will far outweigh the growth of indirect-goods procurement in the coming years.

The balance of power: The early development of e-markets and e-business was focused on lowering procurement costs through both price and process efficiencies. The value proposition to the buyer was strong, and suppliers were reluctant to participate. Although suppliers are now on the move, carefully weighing their e-business options, buy-side applications are just beginning to find their equivalents on the sell side.

Supply-Chain Management

Supply-chain applications are a "catch-all" for the vast array of software aimed at enabling the virtual enterprise and extending information and cooperation throughout the value chain. Ranging from supply-chain planning and optimization software to exception management and decision support, these applications fall into three broad categories:

Commerce related ⑪ – Direct links between companies' systems for the ordering and purchasing of products create process efficiencies and reduce inventory.

Information sharing ⑫ – Sharing supply and demand forecasts, production schedules, and other operational data throughout the value chain reduces inventory levels and enhances planning and optimization efforts.

Collaborative activities ⑬ – Tools such as collaborative design, project management, and automated replenishment reduce time to market, improve customer satisfaction, and reduce errors.

Sell-Side / CRM

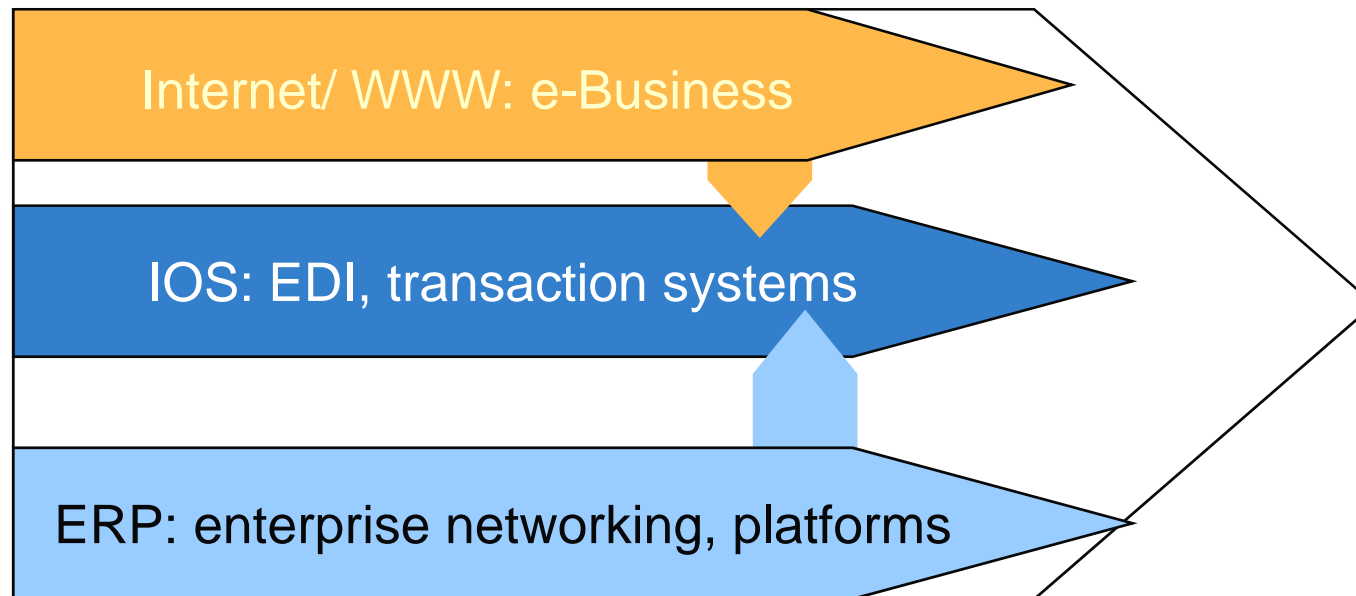
Sell-side applications cover three key areas: order management systems, channel management, and sales-cycle automation.

For those who build them, order management systems take on a progression of complexity as a company moves from a) online catalog ⑭ to b) collaborative design to c) design-to-order. Currently, most companies are in the first phase of order management automation but also are setting the stage to move toward collaboration and design-to-order.

For those with multiple channels or multi-tiered distribution networks, channel management solutions empower the individual partners to better manage the flow of inventory, orders, and information through their distribution channels.

As the economic downturn forces companies to streamline salesforces and try to maintain top-line revenues, sales-cycle automation tools have moved to the forefront of many e-business budgets. Customer Relationship Management (CRM) ⑮ is the most widely known of these applications, focusing on automating and streamlining the marketing, sales, and service processes. It covers a range of applications from areas such as marketing and lead management, marketing automation, and customer service. CRM and sell-side applications are often considered the "front end" of the supply-chain management loop, as the information ⑯ is fed back into various supply-chain planning mechanisms.

Convergence between IOS, ERP and e-Business



Examples of ongoing research initiatives

- Industry impact on the development and diffusion of IOIS
- Real-time communication
- eGovernment - eCustoms

(1) Industry impact on the development and diffusion of IOIS

- Observation: Significantly different development of IOIS within and across industries, across countries
- Approach: Cross-country comparison in selected industries, first case pharmaceutical distribution
 - Strategic drivers/ business models
 - Institutional actors
 - Regulation

(2) Real-time communication and collaboration

- Does the introduction of new applications and platforms suggest that there is a new emerging genre of communication services? Examples are:
 - Siemens' Hipath ® OpenScape™
 - IBM's Workplace Collaboration Services™
 - Skype™ ...

Affordances of RTC

Perspectives Levels of impact	Unified Communication	Availability Management
Individual	<ul style="list-style-type: none"> Integrating multiple, synchronous and asynchronous communication media & devices Ongoing configuration of communication platform: message routing, preferred and call diversion 	<ul style="list-style-type: none"> Selecting communication & collaboration partners Controlling partner access (buddy list) Differentiated signalling facility (availability status and/or preferred media) Facilitating outeraction, i.e. negotiation about communication
Group	<ul style="list-style-type: none"> Ongoing configuration of communication platform for group communication Managing/ configuring (ad hoc set-up etc.) communication and collaboration services and presence-enhanced collaboration tools 	<ul style="list-style-type: none"> Integration of availability information into documents or processes Rules and practices to use (and restrict) availability information
Organisation	<ul style="list-style-type: none"> Unified communication platform Integration of communication & collaboration infrastructure into existing office software and enterprise applications 	<ul style="list-style-type: none"> Integration of availability information into documents or processes Organisational embedding (rules & practices) of availability status (e.g. availability status linked to documents, processes, groups etc.)

Understanding the needs of distributed collaboration

- Organisational practices
- The role of presence, presence awareness, (virtual) availability.
- The effects of signaling presence.
- Creating a context of rules and guidelines ...

(3) ITAIDE

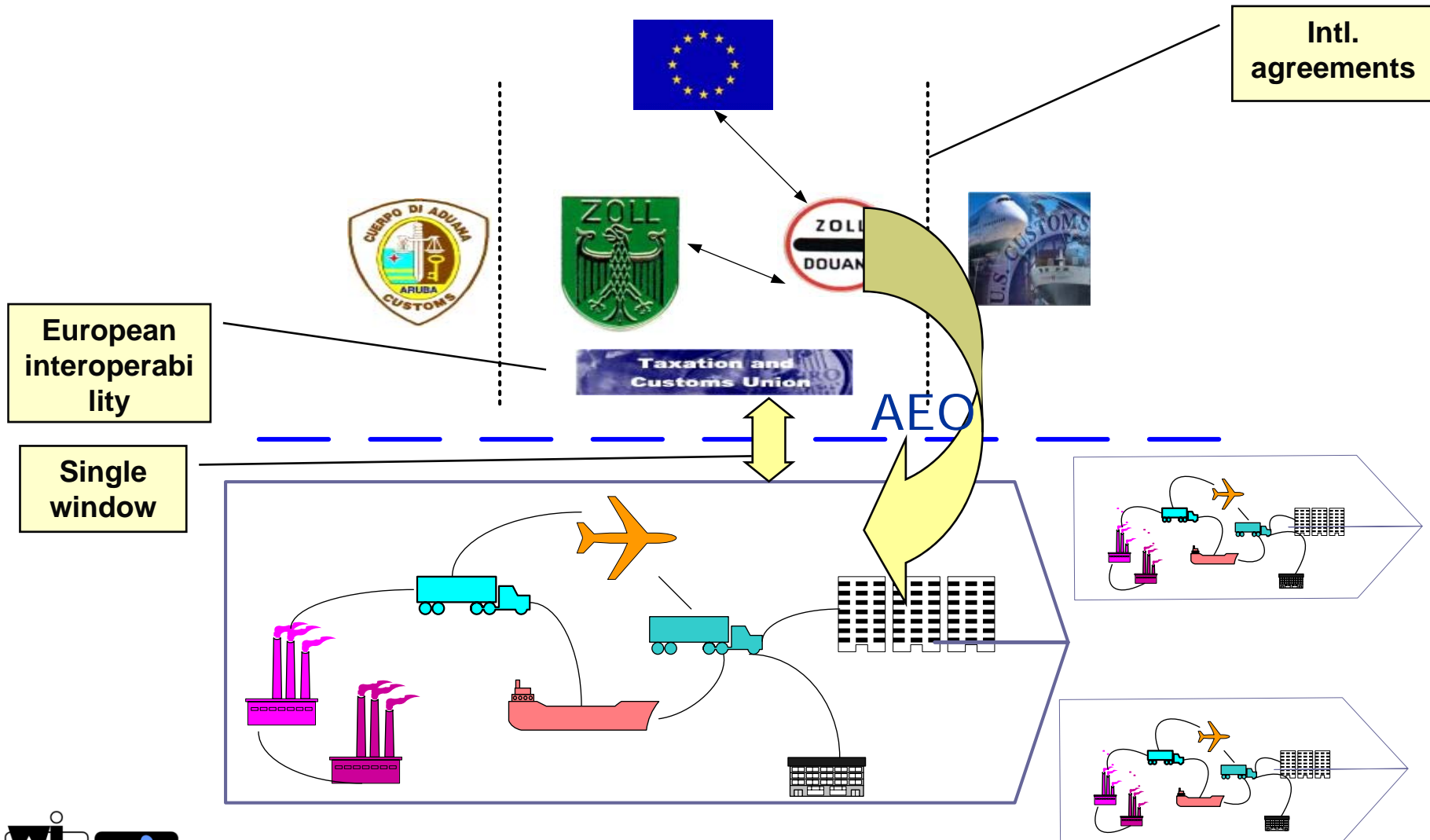


- In cross-border trade European governments struggle with **dilemma** how to simultaneously
 - increase **security and**
 - Reduce the **administrative burden**
- EU **strategic objectives** to cope with this dilemma
 - **Single-Window Access Points (SWA)**
 - **Authorized Economic Operators (AEO)**
 - **Pan-European Interoperability**

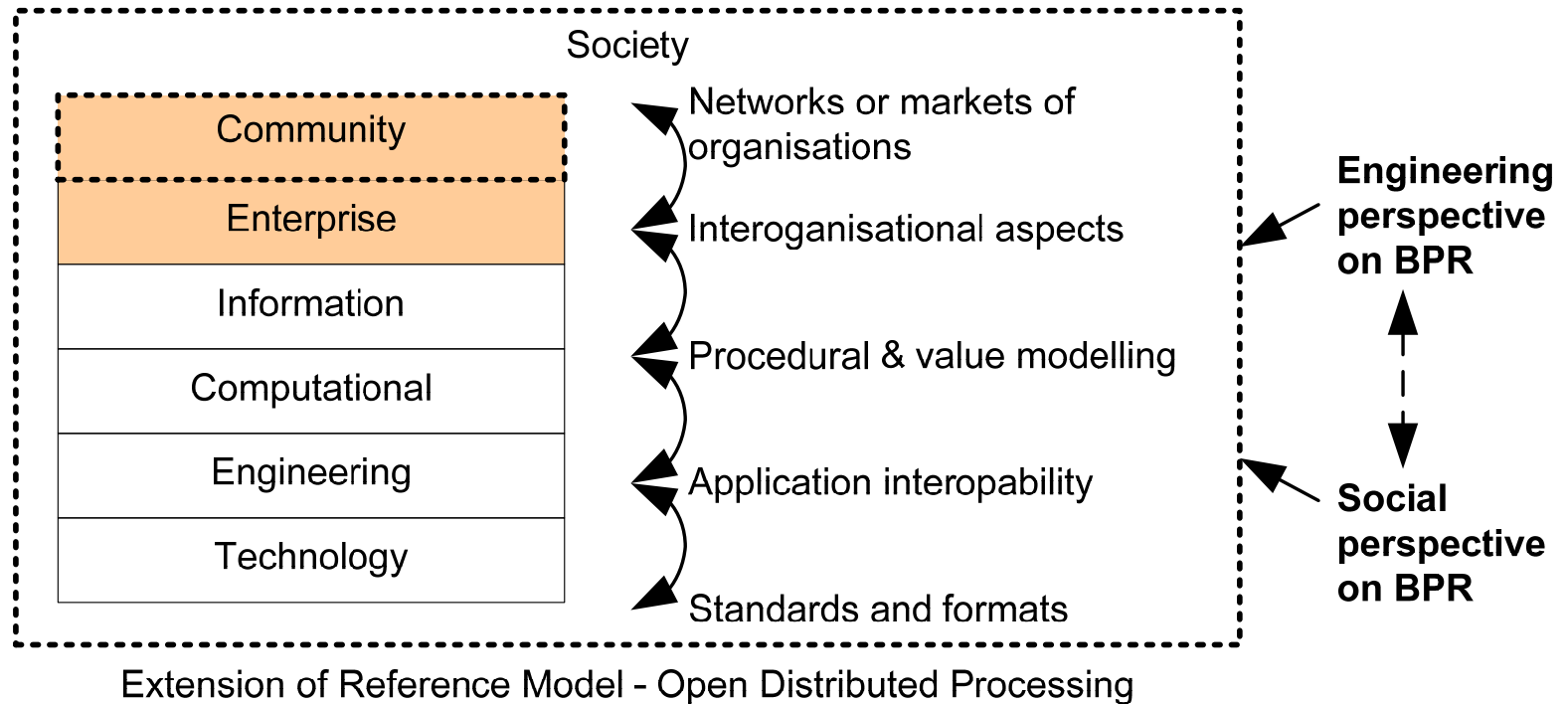
<http://www.itaide.org>

Trends and Issues in Global Trade

Challenges	Examples
Higher volumes	~30% of the world trade crosses borders ~10% yearly growth in global trade volume
More and more regulations since 9/11	UN Regulations, Prohibited Parties, SOX, ITAR, C-TPAT, Dual Use, Export Administration Regulations, ...
New electronic communication requirements with government IT systems	Mandatory filing of SED via AES in the US, European eCustoms Initiative (NCTS, AES, AIS), ICS in Australia, ...
Increased complexity, but less time available	Need to avoid delays at borders – to meet JIT inventory management and meet customer expectations

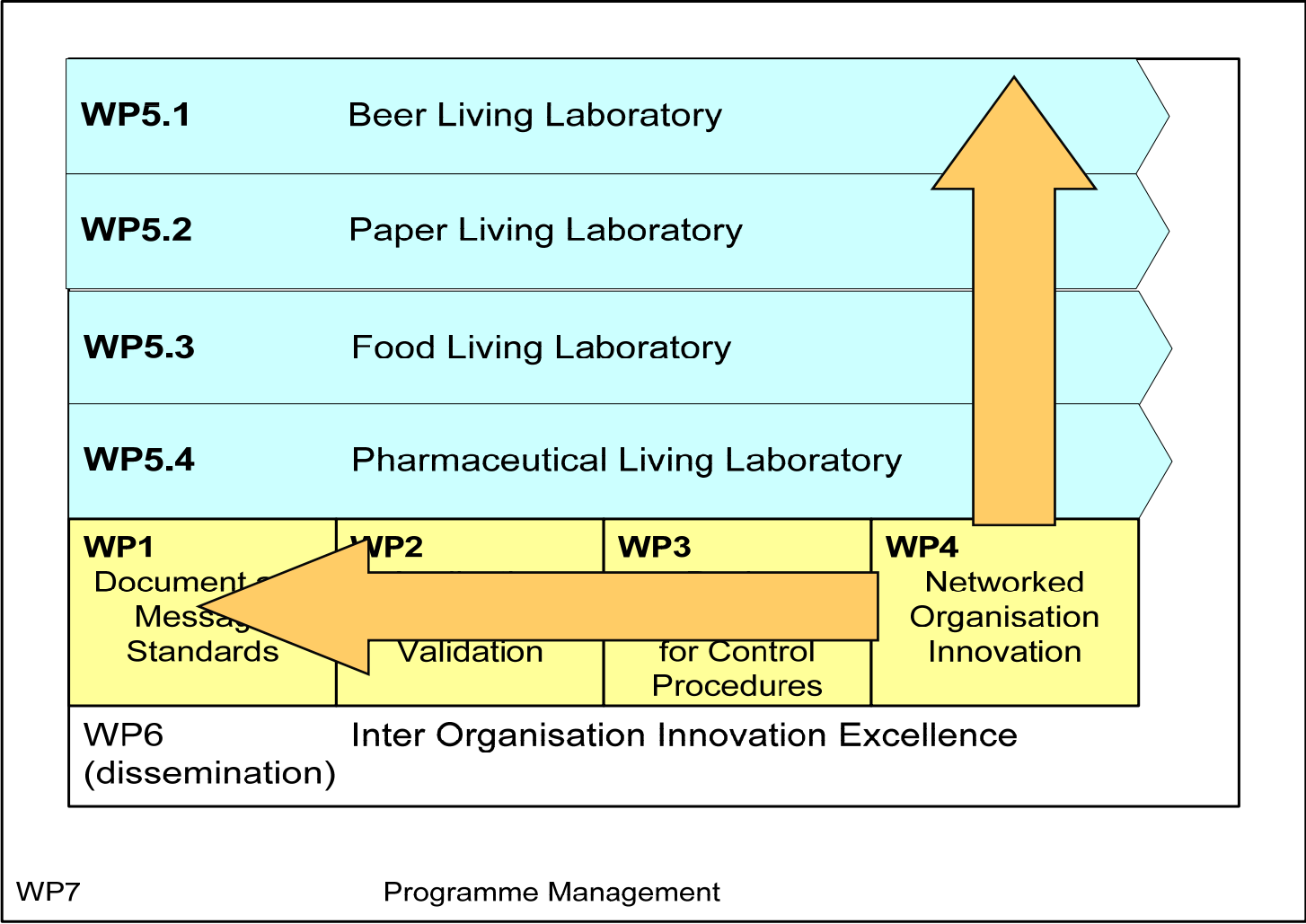


Scope and positioning of analysis: Extended ODP model

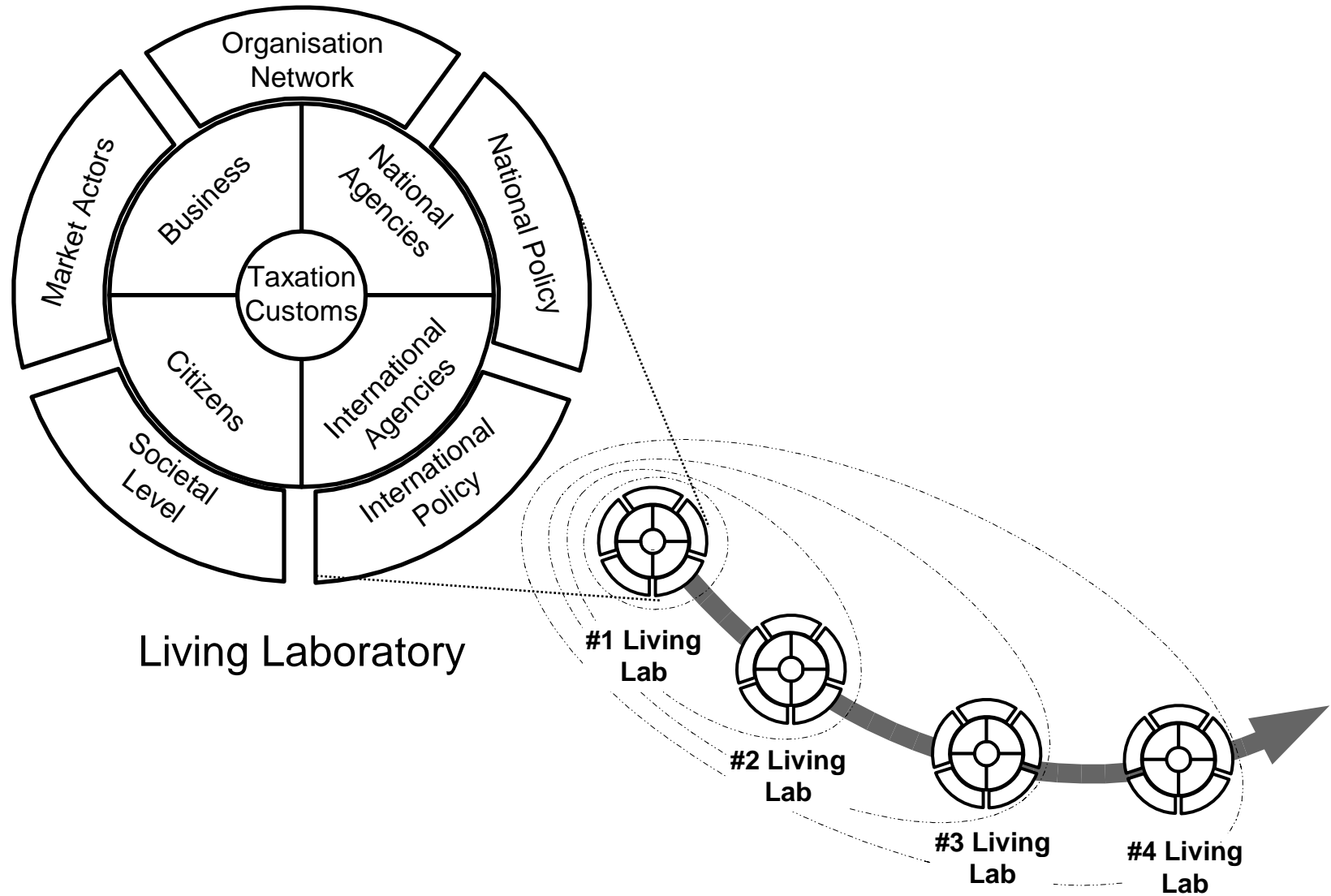


The ITAIDE approach

Inbuilt linkages between workpackages

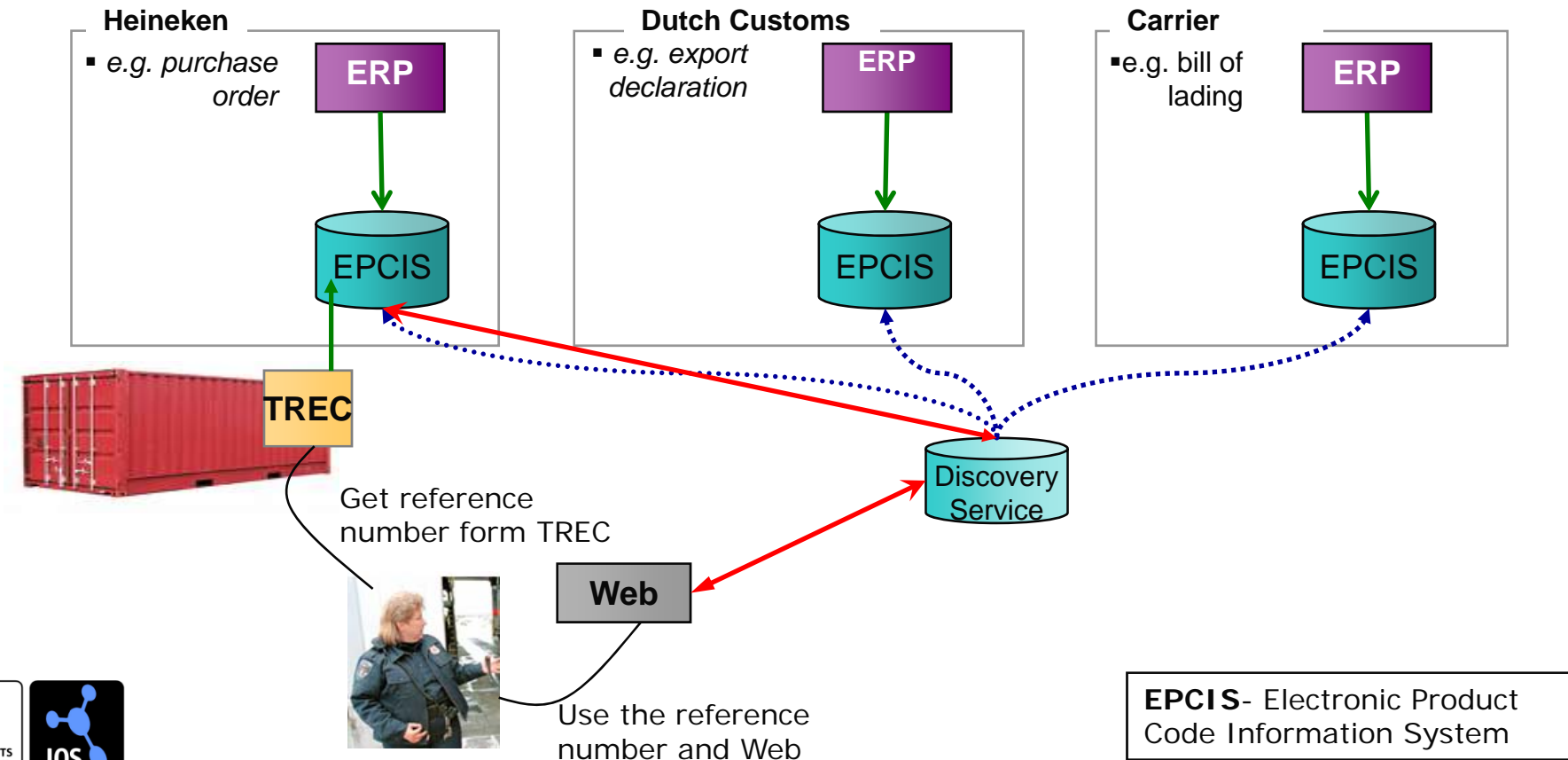


Unit of analysis: Living labs and trajectory



Interoperability and Standards

- Service-oriented architecture (SOA)
- Open standards (e.g. EPCIS electronic product codes)
- One solution for all communications business-government



Summary

- Outline of themes and questions
- The development of networks in a global context
- Organizational and technology view
- Ongoing research initiatives