

eBCM Enablers: **ICT INFRASTRUCTURE**

LEARNING OBJECT #04

INFRASTRUCTURE

Outline

- The nature of infrastructures in different communities
- The benefits of proper infrastructure
- How to utilise infrastructures in an enterprise.

The nature of eBusiness infrastructures

eBusiness infrastructure is a set of interconnected structural elements that openly supports eBusiness in the community. Infrastructure provides organising structure and support for individual eBusiness systems and organisations doing eBusiness. Without proper infrastructure individual cases would be much more laborious, sometimes even impossible to implement. Infrastructure determines how easily the companies can respond to the requirements of modern business and the competitive nature of a global marketplace. The real contents of an infrastructure in different communities may vary based on the character of the community. In this learning objective we look at infrastructures in an enterprise, and at country and international level.

There is no common, single understanding what an eBusiness infrastructure is. Individual understanding may also change in the course of time, because it is a question of appropriateness and because technological development in eBusiness is fast. In this training we have picked up the following structural elements that are regarded as eBusiness infrastructural elements:

- Specific eBusiness legal issues
- Telecommunications networks
- Message mediating services
- Cyber identity
- General solutions and resources that are not case or individual system specific
- Traditional infrastructure like logistics.

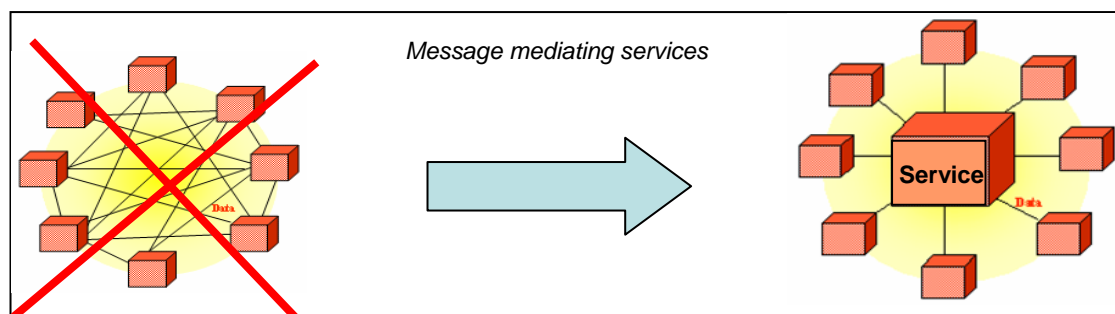
eBusiness infrastructures in a country

Traditionally and too often, *legislation* has taken a too detailed stand also on technological ways to do activities, either intentionally or unintentionally. This has in many cases slowed down the implementation of eBusiness, because legislation has been based on traditional ways to do business. Proper legislation is one of the fundamental issues for a country to become advanced in eBusiness. The government's principal role in the eBusiness community is to create an environment that encourages eBusiness and protects the consumers. Basic eBusiness related laws and regulations are explained in more detailed in another Learning Object.

The very basic precondition for eBusiness is a properly functioning *telecommunications network*, both fixed and mobile. A core element of telecommunications infrastructure is Internet connectivity with proper bandwidth. In EU countries today more than 90 % of companies have an internet connection. A factor affecting eBusiness is the uneven distribution of modern telecommunications infrastructure across a country. In those areas where the information infrastructure is underdeveloped and unreliable, the cost of upgrading the infrastructure can be prohibitive. Yet these same areas would most likely benefit the most

from eBusiness services. Rural areas in particular have the least access to high quality and high capacity modern telecommunications infrastructure.

Message mediating services play an important role in eBusiness because of eBusiness's networked character and because of challenges such as heterogeneity of standards, business processes and technologies. The real challenges are not so much in stable business relationships among few partners but in ad-hoc type business relations with any to any type of connections. The role of message mediating services is to make business communication easier in the way the post services have done in letter mail. However, in eBusiness the challenges are bigger because there normally are no monopolies like in postal business but eBusiness is free market with many message mediating service operators in a country, which must be able to cooperate with each others.



Trust and confidence in an eBusiness environment depends to a large extent on user ability to recognize and be convinced of *the (cyber) identity* of business partners, individuals, enterprises, institutions, services or applications, as well as physical structures and products in a virtual business environment. The procedures for confirming the identity require the entity to present, for validation, credentials that are for example coded in an application, in an electronic token, smart-card or biologically. In addition to proving identity, the validated credentials can be used to certify the authenticity of a particular action or electronic content such as communication and signed business contracts, ensuring transparency of business transactions and compliance to the responsibilities undertaken.

In the process of identifying the business partners and establishing trust and confidence between them, there will be a growing need for liaison services that enable automatic match recognition of business partners, taking into account the legal, professional and societal responsibilities of the organisations or enterprises. The domain also includes the issue of authority of a person when representing an organisation.

More generally it can be seen that *solutions and resources that are not case or individual system specific are part of the infrastructure*. One of such resources in a country is money and one of such solutions is payment service offered by banks. Correspondingly in eBusiness there are electronic money and electronic payment. Electronic money has a minor role nowadays but it is important that consumers in particular can make payments in e-commerce websites. Bank services for companies to pay bills have been available in most countries for a longer time.

One should also remember that when buying physical articles on web it is necessary to have a traditional logistics infrastructure (like post) to take the articles to the buyer. Thus, traditional *physical infrastructure* is also needed in eBusiness.

eBusiness infrastructures globally

The movement towards a global economy has gathered speed over the past few decades as both the practical ability like cheaper communication and political willingness to engage in cross-border exchange have increased. However, the process that is currently under way bears a resemblance to the difficult consolidation over national markets. In developed

countries the existence within the national boundaries of common laws, open labour markets, harmonized regulations, a single currency etc., is taken for granted. These foundations of the national economies are a result of the transition from fragmented to integrated national markets during the last two centuries. This century may witness a transition towards a globally integrated market with global eBusiness infrastructures. However, today integration is mostly happening regionally like in the European Union, in the United States or in Asia. Although there is globally often an appearance of uniformity beneath this homogeneous surface the contours and distinguishing landmarks are complex and differentiated.

This is true also with *e-legislation*. While the Internet may be viewed as "borderless", Internet commercial transactions are not. eBusinesses must be aware of multi-national requirements of their transactions and tailor their business accordingly. Despite international agreements eBusinesses are operating in a fragmented regulatory environment. Multi-national regulation is evolving at Internet speed, particularly in electronic contract formation and taxation, two key areas affecting eBusinesses. However, the regulation does not always require the same things from eBusinesses. E.g. despite EU directives, legislation differences materialise in implementation and interpretation in each country. Further, in limited circumstances, a country can be granted an exemption from compliance with EU directives. Thus, a harmonised global approach to eBusiness is not likely in the near future. Inconsistent state, national and international regulations can apply to a single transaction. Deciphering and applying these varying global requirements to conduct eBusiness is both difficult and time-consuming. Expertise in intellectual property, the Internet, and international trade are crucial skills that eBusinesses need to wade through in Internet regulation. When establishing trust and confidence in a cross-border eBusiness relationship, legal and regulatory constraints need to be understood and taken into account as well as business-cultural differences. Even though the regulatory eBusiness framework within Europe and internationally will gradually become more harmonized, there will continue to be national differences, in particular if the trade is with geographically and culturally distant markets.

The *global telecommunications infrastructure* made big progress with emergence of Internet. Still there is increasing worry about the digital divide. This stems from the fact that the world's population does not have equal access to telecommunication systems. A 2003 survey by the International Telecommunication Union revealed that in terms of Internet access, roughly half of countries have less than 1 in 20 people with Internet access.

While there are challenges in national *message mediating services* in global perspective they are much bigger. Possible infrastructures are mostly industry based or solutions must be negotiated on partner-by-partner basis.

Cyber identity solutions in different countries even within the EU vary greatly, both in sophistication, conceptual approach and technical choices. Local background plays a large role in determining the choices made by national governments or private organisations in deploying their solutions. Some countries prefer to keep their identity management infrastructure entirely under government control, whereas others allow more extensive partnerships with the private e.g. the financing sector. A federated solution (identities from one context/country are linked to identities in another context/country) is an often suggested possibility for solving many difficulties inherent to the development of a cross border identity management solutions. This also requires, besides technical and organisational issues, a solid legal substructure to defuse possible risks. These requirements must meet with international standards and yet must allow individual countries sufficient autonomy to determine their national policies. There are some solutions emerging, like within the framework of Liberty Alliance a great deal of research has already been done with regard to this.

Traditional *physical infrastructure* is needed also in global perspective, but its problems are small compared with the ones of global eBusiness infrastructure.

eBusiness infrastructure in an enterprise

In an enterprise an eBusiness infrastructure is an *integrated suite of infrastructure products* built on open standards that securely and with high availability support communication, high-volume transactions, business process management, application integration, business

collaboration within and across the enterprise, and the ability to create and maintain dynamic eBusiness markets. The key requirements of eBusiness infrastructure include the ability to implement rapidly and the inclusion of legacy applications along with packaged applications and Web-based applications. In the future more wireless solutions and more distributed services should be possible to incorporate.

For a successful eBusiness strategy hardware needs to be chosen carefully. In today's dynamic business environment, primary requirements are scalability and reliability, to ensure the chosen technology can quickly scale in line with projected traffic growth. Enterprises must decide whether to buy, build, or outsource solutions. Each has advantages and disadvantages, but in any case infrastructure decisions should be understood and taken care of, because eBusiness requires a robust integration infrastructure.

The benefits of a proper infrastructure

The eBusiness adoption process is often painful, time consuming and there are obstacles as is always the case when new concepts are introduced. Infrastructure is supposed to bring stability and easiness in adopting new solutions. The poorer the global, national or industry eBusiness infrastructure, the more related activities should be handled at enterprise level. In many cases it is possible to decide and implement those solutions within value networks. However, compared to a case based solution a proper infrastructure would:

- Decrease the total cost of ownership
- Decrease development time and cost in individual cases
- Increase operational quality and safety
- Decrease market risks
- Increase efficiency
- Decrease number of mistakes in eBusiness systems
- Increase manageability and decrease complexity
- Remove barriers to countrywide and international initiatives
- Make information flow and security better.

In some cases an infrastructure to serve the whole community is an absolute necessity. It can then be compared to a utility service. A good example is open communication, when any party should be able to contact any other party on an ad-hoc basis. Without a proper infrastructure accessible to all possible communicating parties, open communication is not possible.

How to utilise infrastructures in an enterprise

Within an enterprise when implementing eBusiness two approaches are possible, tactical and strategic. A *tactical approach* would involve implementing technology for each eBusiness solution quickly, and implementing only the required functionality. The downside of that approach is that the solution may not be reusable anywhere else and management over time could become very expensive.

A *strategic approach* would be to implement an enterprise eBusiness infrastructure, in which key technical components would be reused, thus reducing training and implementation costs for future projects. The downside would be higher initial costs and a requirement that business leaders in the enterprise support the strategic approach.

Among solutions that are candidates to be implemented as infrastructure elements within an enterprise are those that have the following attributes: They can be shared across business units and applications and they lower the cost of ownership. Tight schedules and uncertainties of the future may mean that a tactical approach with individual solutions is preferable. An enterprise should also consider all those infrastructural solutions that are available in its business community, nationally or globally. Implementing its own solution may in some cases be reasonable, but those always have major risks that should be studied so that a conscious decision to reject existing infrastructures can be made.