

FlexWork Blueprint No. 008

(Issue v.01 – 18/9/01)

Using ICT for flexible procurement

How ICT can be used for making procurement activities more flexible and cost-effective.

This is one of a series of 'blueprints' designed to illustrate models of flexible working. It is designed for use by business advisors as a resource when providing assistance to SMEs who are investigating flexible working for their business, or whose business development might benefit from consideration of flexible working.

Prepared for FlexWork by: The Danish Technological Institute. <http://www.teknologisk.dk/28>

More FlexWork materials are available at <http://www.flexwork.eu.com>

FlexWork Blueprint No. 008 (Issue v.01 – 18/09/01)

Using ICT for flexible procurement

- How ICT can be used for making procurement activities more flexible and cost-effective.

Note that ICT refers collectively to information and communications technologies, e.g. computers, telephones (fixed and mobile) and networks such as the Internet.

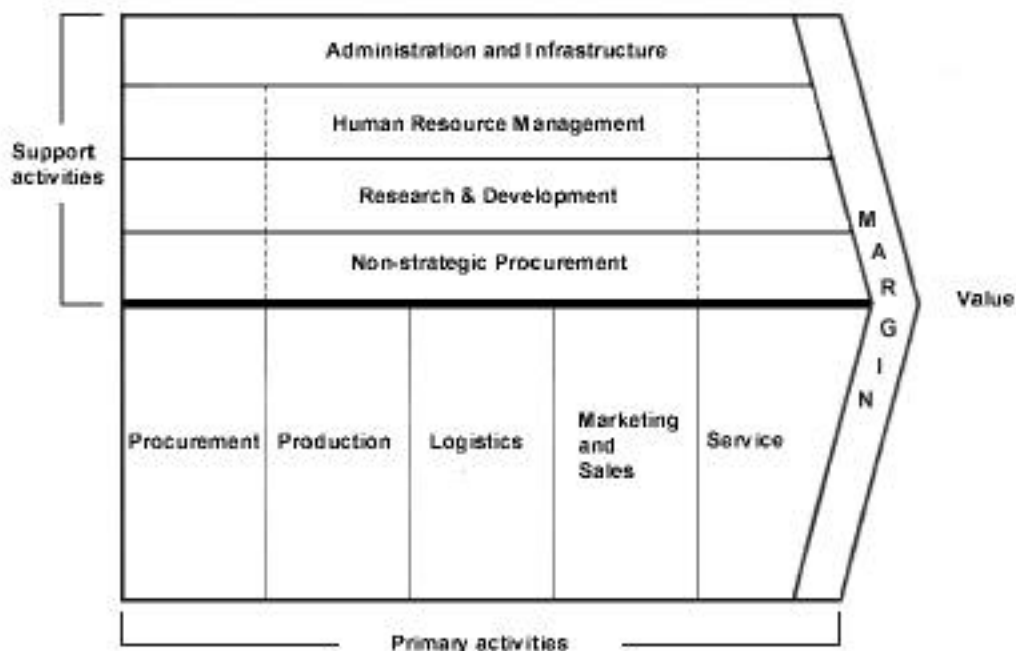
1. Overview

Within the few last years, much have been said and written about how ICT can be used to enhance the competitiveness of modern enterprises and thus their profitability. Even though an overwhelming body of literature has been published on the subject, there is still a need for practical guidance on how enterprises in real life can exploit the new technology to work flexibly and enhance profitability and competitiveness. Some of the reasons for include that facts that:

- technologists tend to think in terms of pure technology and forget about the usage environment.
- lack of thorough understanding on the part of small businesses and their advisers about how ICT impacts diverse business areas and their relationships.

Therefore there is a need for a practical view on how ICT impacts diverse business areas coupled with a deeper and more business oriented approach..

A good way to understand the structure of the enterprise is the *Value-chain* concept, introduced by Harvard University professor Michael Porter).



The value chain

Broadly speaking, the idea is that an enterprise consists of a series of primary activities (procurement, production, logistics, public relations, services, etc.). These activities cannot define the whole enterprise, but are enhanced and complemented by support-activities like administration, human resource management, research and development, etc.). These support activities do not themselves create profits and wealth for the business, but are necessary processes for the enterprise to keep functioning as a viable unit.

ICT can be used to support and enhance all of these activities – including both support and primary processes. However, it is necessary to get a clear understanding of what the technology as such can do to enhance the flexible working of businesses before looking at specific business activities. The following quotation offers a definition:

“ICT is first and foremost a networking technology. That is, a technology that can be used to connect different entities, departments and enterprises in one common network. Apart from anything else, this facilitates a dramatic increase in the possibilities for communication and cooperation.” (The Danish National Business report, 1996).

As this quotation makes clear, it is important to understand that the ICT is first and foremost a *networking technology*. Often stories appear in the media about a business that introduces new information technology without gaining anything from it. The main reason for this is usually that the enterprises has forgotten to consider how the new technology can be used to change existing activities into something more effective, and instead concentrates simply on digitising existing processes, making them more efficient but keeping them doing the same thing. Neither is any thought given to how the organisation can change. For example, as the typewriter is replaced with a much more expensive Personal Computer, the tasks being done do not change. It is “the same procedure as before”, but with the use of much more expensive technology. This problem is known as the “ICT paradox”, or sometimes the “productivity paradox” as so much investment is spent on so little increase in overall productivity.

If a company wants to introduce ICT, it is therefore important not only to consider which business activities to digitise, but also to construct an accurate picture of how to change or optimise existing ways of working and business processes using the technology, making both more flexible. Thus, when looking at the value chain, all the activities could be made more flexible with the help of ICT – it would be possible to provide one Blueprint for each activity. However, this would be a daunting and complex task.

Therefore, in this blueprint, we will focus on how ICT can used to enhance procurement activities and make these more flexible. In other words, we take as the point of departure the flexible digitalisation of the procurement function and describe the technologies that can be used, the cost and benefits related to these, and how this can be done by working more flexibly. However, as it is stated above, it should be remembered that digitisation of one activity will, in principle, impact all other activities in the value chain as well – it is important that the enterprise remembers this. So even though, this Blueprint focuses on the procurement activity, other activities will be involved. Where important these will also be referred to.

When considering how to use ICT to optimise procurement activities and making them more flexible, the following two technologies will be central.

- **EDI** (*Electronic Data Interchange*) is an older but still widely used technology.
- **Electronic Marketplaces** is a more modern technology that currently is growing very fast based on the Internet. It is becoming more and more widely used by a large number of diverse enterprises.

The costs, benefits and characteristics of these technologies will be described in the following chapters. By using these technologies, enterprises will be able to make their own procurement activities more effective as well as achieving a higher degree of flexible cooperation with diverse suppliers of raw materials.

2. Rationale and Target Audience

2.1: Target audience

EDI and Electronic Marketplaces based on the Internet are widely used technologies employed by all types of enterprises. However, a certain degree of modern technological infrastructure is needed within the enterprise itself as well as in the wider network. Very basically, if the company has access to the Internet they can use the Electronic Marketplaces and gain the benefits related to these. This is also generally true for EDI-systems, although these do, however, often also require the implementation of specially designed EDI-modules. Consequently, a company can go a long way if they have access to the Internet and a standard Internet Browser. On the other hand, it is important to point out that the largest benefits only can be obtained if the procurement systems (in this case either EDI-systems or Electronic Marketplaces) are well connected to the other systems of the company. These specifically include the stock-, production- and financial management systems (i.e. the ERP – Enterprise Resource Planning system).

This integration of systems is important if the aim is to obtain the full potential of EDI and Electronic Marketplaces. These technologies will be described in detail in chapter 4 – Technology Profile.

When considering how to make procurement activities more effective, this Blueprint is primarily focusing on traditional manufacturing enterprises which, on a daily basis, undertake procurement transactions when buying raw materials from selected suppliers. Of course, it is also possible for service enterprises to use ICT in enhance procurement, but due to the fact that the procurement activities of a service company tend to be rather limited compared to a traditional manufacturing company, the benefits are also relatively fewer. Overall, the benefits from using EDI or Electronic Marketplaces in procurement activities are estimated to be greatest in the following cases.

- if the company buys large amounts of raw materials.
- if the company often (e.g. on a daily basis) undertakes procurement transactions.

These scenarios are not very common among most service enterprises (even though large service enterprises do tend to have large procurement activities).

Thus, ICT as a method for making the procurement activities more effective is useable in most parts of Europe – the Internet is today more or less accessible even in the most outlying regions. However, the

within the enterprise. It is certainly possible to use ICT (either EDI or Electronic Marketplaces) for procurement without integration of existing systems. This could, for example, happen in an enterprise that simply does not have electronic logistics- and financial management systems. These types of enterprises could gain benefits by using ICT for procurement, but the benefits will not be as clear cut as in enterprises with large management systems and a high degree of integration among diverse systems.

Finally it should be noted, that this Blueprint is first and foremost directed at enterprises with significant procurement activities on a daily (or almost daily basis). Thus the size of the enterprise is of some importance. The enterprise should have a size that makes procurement activities serious – that is of a significant size. Small enterprises with limited procurement activities can certainly use the technologies mentioned in this Blueprint, but these companies could find that the costs associated with implementing these technologies and the integration with other systems exceed the benefits (cost savings) they gain by undertaking electronic procurement. Thus, a rule-of-thumb could be that the size (both the company itself, but also the extent of procurement activities) and benefits associated are closely related. The company that wishes to implement these technologies should closely assess the size of their procurement activities and the benefits they are likely to gain.

2.2: Rationale

There are many cost and benefits associated with the use of EDI and Electronic Marketplaces. The table below shows some of these.

Benefits		Costs	
<i>Qualitative benefits</i>	<i>Strategic benefits</i>	<i>Direct costs</i>	<i>Indirect costs</i>
More flexible and less bureaucratic procurement processes	Access to new (and cheaper) suppliers	Costs related to establishing the system	Education and competence development for the users
Diminished post and packing (P&P) expenses	Integration	Current expenses	System integration
	Retaining cooperation with known supplier	Variable expenses	
	Improved overview of procurement activities and stock management		

The above mentioned costs and benefits are relevant when using either EDI or Electronic Marketplaces as a procurement technology. However, each technology also has its own distinctive cost and benefits.

EDI-systems

EDI-systems are a common name for a series of systems which enterprises can use to exchange data with other businesses and institutions. Very basically, one can say that e-mail is an EDI-technology. However, this is not how we define EDI here. Normally, EDI-systems are an application that links the procurement system of the buyer-enterprise with the stock-, production- or selling system of the supplier enterprise. By linking supplier enterprises in one common network, the Buyer Company will find that procurement activities become more effective. At first, the post and packing (P&P) and paper expenses will be minimised. One may think that this is a trivial saving, but this is not the case. Perhaps P&P expenses only represent a minor expense for the company, but if the total expenses used on P&P

each year are summed they often much greater than initially thought. In addition, it is necessary to take into account the amount of time that people use filling out the paper forms, putting them into envelopes and sending them off. However, often even more important are the number of misplaced orders and deliveries with errors which can be dramatically reduced with EDI. As such, EDI systems can be more or less advanced and more or less integrated with the remaining systems of the enterprise. It is self evident that the largest benefits are obtained if systems are integrated. For example, if a company has integrated the EDI-based procurement system with the financial, production and stock management system it is possible when placing orders for it to take into account the existing stock level of the company, the expected production capacity and the order portfolio. Finally, when the order is actually placed, the money will automatically be transferred from the financial management system to the supplier enterprise. Book keeping activities becomes much more effective and it is possible to keep a broad overview of the financial resources of the enterprise and the flow of hard cash. As one can see, there are many possibilities for rationalising work processes and working arrangements, and for making these activities more effective. Paperwork becomes minimised, and, in addition, the stock capacity and production management system become integrated, all of which facilitates a much more appropriate procurement process and production planning becomes easier.

Finally it should also be noted, that an increasing number of supplier enterprises today require buyers to place their orders using EDI-systems. These systems are integrated to such an extent with their production system, that they simply cannot handle traditional paper-based orders – it's too bureaucratic for them. Thus, some consultants are of the opinion that there is a danger that some enterprises could be completely cut off from some suppliers if they do not use EDI-based systems – or at least have some kind of knowledge about them. Our experience is that this is an over dramatised threat. If a supplier enterprise only accepts EDI-based orders but the buyer does not have access to these technologies it is still possible to place an old-time paper based order, but the price of the raw materials is likely to increase significantly due to the fact that the supplier has to process more paperwork more slowly. They may not be left completely out in the cold, but they will be offered very unfavourable market conditions.

Electronic Marketplaces

Many enterprises have used EDI-systems for several years – it is a widely used and accepted technology. That is not the case with Electronic Marketplaces, however, which have emerged on the Internet scene quite recently, so that only a limited number of enterprises have practical experience in using them (at least when compared to EDI-technology).

To see an example of an Internet based Electronic Marketplace, please follow these links:

<http://www.emarketservices.com> + <http://212.112.191.139/emarketservices/mainpublic.asp>

These web-site addresses give access to a site which contains links to a diverse array of marketplaces.

The number of Electronic Marketplaces is growing rapidly. The sites mediate contact between buyer organisations and the suppliers of a wide array of different raw materials – chemicals, construction elements, metal components and the like. Each product group has its own site (often there are many sites per product group ordered in relation to the specific characteristics or region they serve), and the buyers can then place orders or suppliers can offer their goods. The procurement process is often auction-based; the buyer can either choose to buy the cheapest product or perhaps choose a supplier with better quality. Electronic marketplaces are often established by independent companies that do not produce the goods themselves, but they simply administer a forum where buyers and sellers meet. Thus, it will be obvious that such marketplaces are rarely free of charge to use. Payment takes place either as a one-

off fee, or, as is now becoming more and more common, the enterprises pays a fixed percentage of the goods they trade at the marketplace as a commission to the host company.

The benefits related to the use of Electronic Marketplaces are, first and foremost, that the enterprise gains access to an array of supplier they did not know prior to entering the marketplace. This also implies the possibility for comparing both prices and terms of delivery. This, again, increases the competition among suppliers, forcing them to work more effectively, and prices are likely to drop further. Some companies say that they have saved up to an impressive 40-50% on procurement, however these are probably exceptional cases. More probably, companies can save around 10% to 15% by using the marketplace compared to their existing suppliers.

EDI and Electronic marketplaces have been described here in relation to their benefits. However, it is no secret that the technologies also have some drawbacks which companies must also address, especially when deciding on technology platforms and implementation. These aspects will be described more fully in chapter 6 – Deployment advice. In the following chapter, a typical usage scenario (TUS) for the technologies is described.

3. Usage scenario

As stated above, EDI and Electronic Marketplaces can be used to make the procurement function more effective and flexible. It is possible for a company to use both technologies simultaneously, but overall the two technologies are primarily aimed at two different procurement situations each with its own distinctive characteristics.

Consequently, we have decided to describe two distinctive usage scenarios, each with its own technology (either EDI or the marketplace) and special characteristics. The cases used here are not invented for the purpose of this Blueprint, but are actual case companies from a Danish context. When describing the typical usage scenarios, some of the drawbacks are also highlighted, but these will also be treated individually in chapter 6.

3.1: The use of EDI in relation to procurement of commodities

At the end of the 1990s, a Danish supermarket started to use EDI in relation to the procurement of its grocery products. The chief of procurement is responsible for the procurement of 9,453 different grocery items. This may seem like a large number, but many products are procured from the same supplier. Thus, the number of suppliers was approximately 350, some being more important than others. This supermarket is not much different from a traditional manufacturing company when looking at procurement activities. Many production enterprises have a similar number of items that need to be procured, often from a relatively small number of suppliers. Previously, the manager responsible for procurement at the supermarket found it difficult to keep an overview of the groceries kept in stock and on the shelves of the supermarket – not to say problems in integrating stock status with expected sales and thus the necessary procurement. The manager had a computer based stock management system, which to some degree provided him with the necessary overview, but very often he experienced problems with misplaced orders, groceries located in stock that became too old, and, more importantly, incorrect deliveries. Paperwork was also an activity that took a long time, not only for the manager himself, but also for the employees working in the administrative section of the enterprise. Thus, the manager had only a limited amount of time to find new and cheaper products, to visit new possible suppliers, and, in general, to keep an eye on market developments. These activities would be more profitable and valuable for the company than simply filling out pieces of paper.

By introducing the EDI-system and connecting this with the sales system of the supplier (and their own stock management system), the procurement manager created a better overview of the goods that the supplier produced together with the groceries that the Supermarket already had in stock. The procurement activities became very significantly more effective, paperwork was minimised and the procurement process became overall more flexible. In addition to decreasing paperwork, the supermarket found that the number of incorrect deliveries was minimised and this had a directly positive impact on the bottom line of the supermarket's accounts.

Even though the above scenario takes its point of departure in the experiences of a supermarket, this is not substantially different from what any traditional manufacturing enterprise would experience. In summary, EDI makes it possible to:

- create a better overview and linkages between the company's own stock situation, expected sales and procurement activities
- make the procurement process more effective
- dramatically diminish paperwork
- achieve a declining number of incorrect deliveries
- obtain the largest benefits if the EDI-based procurement system is linked to the financial-, stock- and production management system of the enterprise..

3.2: The use of Electronic Marketplaces in relation to procurement of non-commodities

This case enterprise is a Danish manufacturing enterprise which produces mechanical components for the metal industry. The central theme of the case is that, of course the company has procurement activities, but these do not even closely reach those of the supermarket mentioned above in terms of magnitude. The enterprise has had a close relationship with a quite small number of suppliers, which are very content with the existing cooperation, the fair prices and the accuracy of delivery. Overall, they see no need to change. The number of suppliers is relatively limited and most often procurement is a process that happens occasionally when compared to the Supermarket case as deliveries occur once a week, or even more infrequently. However, when the company places an order it often includes a very large amounts of raw materials. On the surface, it seems that there is no need for electronic integration among the company and its suppliers; the paperwork is not overwhelming and defective deliveries are kept to a minimum.

Recently, case company in question received a large and very profitable order from a new customer. They wanted to accept this order, but the existing supplier network was not geared or ready to procure the large amount of raw materials necessary and it was not likely that they would be react within an acceptable time frame. Consequently, the enterprises started a search for alternative suppliers of raw materials. Even though the company had no prior experience using the Internet for sales and procurement of goods, they decided to try the new Electronic Marketplace. They found a European based marketplace for raw materials in the metal industry. The company paid the admission fee and placed the order in a free auction and then it was up to the suppliers to bid in. It should be noted that this was a very specific isolated order, even though it was very large. As a result, the enterprise came in contact with a large number of new suppliers, of whom they had no previous knowledge prior to entering into the marketplace. More importantly, they very quickly succeeded in finding a supplier who was able to produce the necessary raw materials at an acceptable quality within an acceptable time frame, and at a competitive price.

Subsequently, the procurement manager stated that he was so impressed by the amount of possible suppliers he had discovered. Even more surprisingly for him was the price of the goods, as these were approximately 20% below the market price in Denmark, even assuming the Danish suppliers could deliver. On the negative side, however, the manager mentioned that the design of the marketplace was somewhat confusing. There was much to be learnt, and, in addition, it had been a difficult task to see appreciate and examine all the offers he received and the enterprises he came to know. However, he was able to procure what he wanted even though the process of finding and buying had been troublesome. Subsequently, he mentioned that he had learnt a lot, so if a similar problem should arise in the future he now felt better equipped for participating in the electronic marketplace.

In summary, electronic market places are likely to:

- dramatically extend the range of suppliers
- significantly reduce prices and improve delivery terms for a given quality
- ensure that sufficient supplies are available in times of shortage or when delivery needs to be rapid
- provide back up suppliers when reactions need to be rapid.

4: Technology Profile

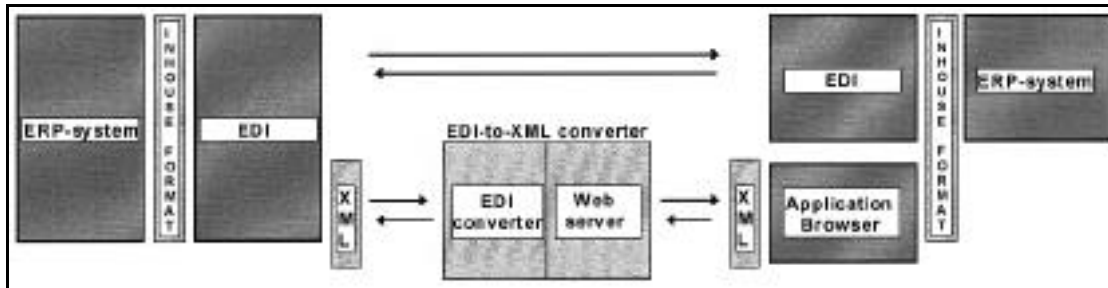
It is difficult to be specific about the technologies behind EDI and Electronic Marketplaces as they are generic technologies, but it is possible to describe some characteristics and standards for each.

4.1: EDI – Technologies and standards

EDI is a widely used and accepted standard. Very specific EDI-modules that can be directly used by diverse enterprises are developed by major companies, but these solutions are often quite expensive. Today, most companies have a financial management or ERP-system. Most common are systems like the Concorde XAL, Navision or the German product SAP/R3. A common feature of all these systems is that it is possible to attach an EDI-module, which makes it possible for the enterprise to use EDI in their transactions with suppliers and collaborators. As mentioned previously, a company obtains the largest benefits if the EDI-based procurement system is linked to the financial-, stock- and production management system of the enterprise. By acquiring an EDI-module from the same source as the ERP-system itself, it becomes easier for the company to link diverse systems and make them interoperable. This eliminates problems concerned with standards and different system specific protocols. There have been many examples of a business which has purchased a specially developed EDI-module which cannot communicate with the remaining systems installed at the company. Often these companies must subsequently pay large amounts of money for after-sale service and adjusting the system to fit into the company as a whole.

In the infancy of the EDI technology, there were major problems making different EDI-systems communicate with each other. Different companies developed different EDI systems that were not interoperable. Bit by bit these problems have vanished, however, through the introduction of some very specific rules and specifications on how EDI-systems should be developed. These rules are collected in the EDIFACT standard (*Electronic Data Interchange for Administration, Business and Transport*) which is maintained by UNCE (*United Nations Economic Commission for Europe*). By implementing this set of rules, a company can be quite confident that most EDI-systems will be able to communicate without problems.

The latest development within the EDI world is that today is it possible to use an ordinary Internet browser for exchanging EDI-based information. For this purpose, the language XML (*eXtended Markup Language*) had been developed. This language (*or more precisely "protocol"*) has the capacity to "translate" the EDIFACT information to standard HTML, which can be understood by any browser. Please see the following figure.



EDI-XML interoperability

If this technology becomes widely accepted, then the enterprise will not have to worry whether their suppliers are in possession of an EDI-system that can communicate with theirs. XML converts EDI to HTML, which can be understood by any standard browser. However, it is unclear how widespread XML technology is. On the other hand, there is no doubt that when the technology eventually becomes a commercial success, then XML will provide more companies with access to the use of EDI without the need for specially designed applications.

4.2: Electronic Marketplaces – Technology requirements

The Electronic Marketplace is the marketplace of the future. On the one hand they are surprisingly low-tech, but on the other hand they have the capacity to bring large value to the user companies. In summary, it is possible for every business with access to the Internet to use the Electronic Marketplaces. All communication and interaction takes place at the marketplace, and there is no need for anything else than knowledge of the English language and the ability to find the way around a homepage. It is basically as simple as that.

Problems and drawbacks with such technologies are not as much technological as organisational. This will be treated in the next chapter.

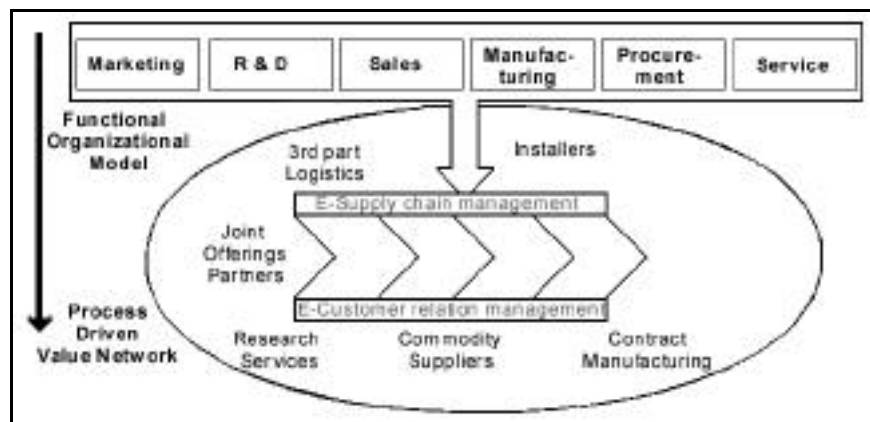
5: SME structural and Process Issues

The use of EDI and Electronic Marketplaces places heavy demands on the organisation and the competence level of the enterprise and the individuals working within it. When procurement activities becomes digitised and more effective it is necessary for the company to consider who is to have access to the system. Access authority should be allocated and areas of responsibility made visible to all. It becomes very easy to place an order with the help of the system and there are many examples of the number of orders rising dramatically. People forget to check the inventory system before placing an order because it is easier for them to order a new product than checking if it is already kept in stock. In this context, it is also necessary for the integration of systems to be addressed. Those employees who have authority to place orders should have access to data from the stock management system and additional financial information. Transactions via EDI often take place very fast, and it therefore not helpful if the procurement manager does not have financial freedom and authority to make a decision within certain limits. If the actual order is placed via EDI, but book-keeping and payment is done in a

traditionally manner, then there are great risks that all the benefits gained will be “eaten up” by the bureaucracy of other tasks and departments.

One area which should be mentioned, but which is somewhat broader than just the digitising of the procurement function, is the fact that the enterprise can suddenly become very aware of the benefits of electronic partnerships and networks.

As stated in the introduction to this Blueprint in relation to the value chain, it is possible to digitise all of the activities in the value chain (both support and primary activities). EDI (and other technologies) can be used to exchange information with other business and collaborators, for example in relation to E&D, marketing, sales and others. In the future, businesses should consider what is profitable to produce in-house, and what tasks that could be placed outside their own plant without loss of efficiency. As stated in the quotation on page 2, ICT is first and foremost a networking technology, which has the capacity to link diverse units and businesses in one common network. In the future, the companies should consider how diverse value chains could be linked and “play together”. ICT can make different value chains (and thus diverse businesses) come together in one common value-network, which is also known as the Extraprise. The figure below illustrates this.



Enterprise & extraprise

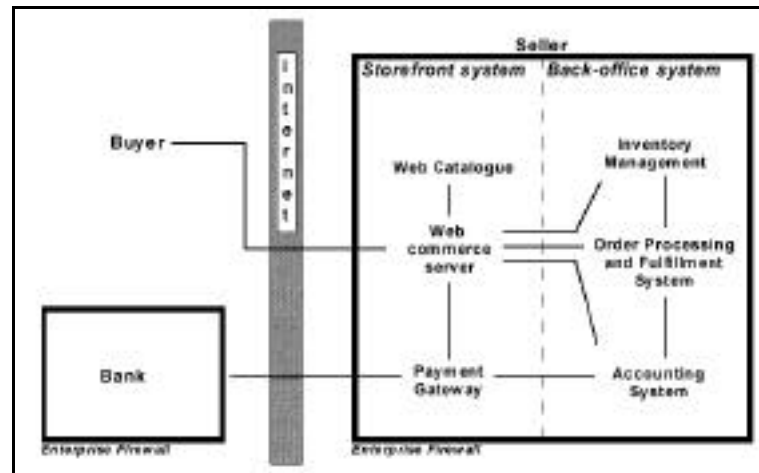
Establishing the Extraprise is not something that all enterprises should start right now, but the use of EDI and Electronic Marketplaces could be the first step towards the Extraprise and it is always an advantage to be aware of what the future might bring.

In summary, the introduction of EDI and Electronic Marketplaces:

- requires a more transparent distribution of areas of authority
- necessitates the specific development of staff skills and competencies
- needs to consider the degree and possibility of system and process integration, so that the work tasks of individuals, teams and departments may need to change
- could be the first step towards the Extraprise – that is an accelerated use of ICT to link diverse activities in the value chain together with others in a value network. If this happens it will have major impact on the structure and organisation of the enterprise and the way individuals work within it.

6: Deployment advice

How EDI and Electronic Marketplaces are implemented and used have already been described above. These are not particularly advanced technologies, but businesses should remember that system integration is a major and important point that needs to be addressed. Only by having close linkages between existing systems – like stock,- financial- and procurement management system - is it possible to obtain really large benefits. The figure below gives an example on this.



As mentioned previously, both EDI and Electronic Marketplaces have some drawbacks, which the companies need to address – this can impact their choice of technology platform.

6.1: Costs, Benefits and Transaction-costs.

Some of the costs were briefly mentioned in chapter 3. The characteristic of the specific procurement necessary heavily influences the choice of technology (either EDI or Electronic Marketplace). This aspect can be illuminated by understanding how transaction costs operate.

Very basically, not only is the price of a product important but also those costs which are associated with the transaction. Both need to be taken into account when determining a supplier. Having this in mind, the available technologies can be seen to have a series of both benefits and drawbacks.

When using EDI as a procurement medium, transactions take place extremely fast. The opposite is the case when using the Electronic Marketplace as this is more time consuming but, on the other hand, it is more likely that prices will be low. EDI require relatively close connections with the selected supplier as both supplier and buyer need to integrate their systems to some extent. Thus, a longer term relationship tends to be built up over some time with considerable care in determining who to partner with. It follows from this that there will be relatively high transaction costs if a supplier is changed. Again, the opposite is the case with the Electronic Marketplace, where there is no (or only very limited) need for integrating the technological platform and thus there are none or only limited transaction costs associated with changing supplier.

If we take a retrospective look back at our cases, it suddenly becomes obvious why the supermarket decided to use EDI, while the manufacturing company turned to the Electronic Marketplace. The supermarket places many orders daily and the price of the groceries doesn't change significantly

between different suppliers, only in relation to rather unimportant marginal costs. On the other hand, the supermarket saves resources on low transaction costs as transactions are carried out fast, there are no misplaced orders, no defective deliveries and the paperwork has been drastically minimised. But the price is the same as always.

Again, the opposite is the case for the manufacturing company who needed to place a single large order. The transaction costs were rather high, as the procurement manager used a lot of time understanding and exploring the marketplace and needing a lot of time to examine all the offers he received. On the other hand, when he finally decided to accept an offer he succeeded in getting the raw materials at a very low price. The result was that, even though the transaction costs were high, the bottom line showed a positive result because the price of the product was low.

Consequently, when an enterprise considers using ICT for procurement – either EDI or Electronic Marketplaces – they should address the following issues.

- how large are the transaction costs associated with this specific order using different mediums?
- is this an isolated order (non-commodities) or is it a frequent order (commodities) where the existing suppliers can offer the goods at an competitive price.

The table below provides a rough guide to the choice of technology for procurement.

Characteristic	Price of good	Transaction cost	Technology
Individual large procurements (<i>non-commodity</i>)	The price of the good plays an important role. Significant price competitiveness is expected.	Transaction costs can be high if the price of the good is low.	Electronic marketplace
Frequent smaller procurements (<i>commodities</i>)	The price of the good is not particularly important. It is expected that nearly all suppliers will deliver at a similar price.	Transaction costs <u>must</u> be low. Problems are caused by significant bureaucracy and paperwork.	EDI

In summary, the Electronic Marketplace and EDI each have both shared and specific advantages and disadvantages. If both advantages and disadvantages are understood and a suitable technology is employed together with a specific way of working flexibly in the right situation, it is possible to exploit the advantages whilst potential problems are minimised.

7: Related cases

The web site <http://www.flexwork.eu.com> includes links to a large number of online resources, many of which are relevant for the Blueprint.