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## THE IMPACT OF E-COMMERCE ON TRANSPORT SERVICES

### ABSTRACT

*The impact of information technologies on transport services has been very considerable in the last period. Along the supply chain there is a variety of different activities going on, from ordering, invoicing, warehousing, shipment, insurance, custom clearance ... A long chain of subjects where each of them has an important role.*

*Efficient and effective exchange of information between all the involved parties seems to be a great challenge of today. Accomplishing this will determine the best possible and sustainable position on the logistics scene.*

*Being successful in this environment today requires big organizational efforts and financial investment in adequate technology. The basic task of such up-to-date technologies to provide fast and reliable information flows between parties involved in a certain business operation. There is therefore a need for a good and sound information system.*

### KEYWORDS

*transport services, logistics, supply chain, e-commerce, information and communication technologies, Internet*

### 1. INTRODUCTION

What is the impact of e-commerce on transport services? In order to define a good answer to the question, a broader look on the characteristics of electronic environment and its further implications should be made. Therefore, this paper aims to summarize these new characteristics of the new way of doing business in today's fast changing environment. It explains the importance of electronic commerce, new information and communication technologies, and consequently their logic impacts on transport services.

### 2. ELECTRONIC COMMERCE AND ITS DEFINITION

The first step is to define electronic commerce. There are many definitions and some of them are summarized below.

*"... the buying and selling of goods and services on the Internet, especially the World Wide Web. In practice, this term and the term e-business are often used interchangeably..." (Lynch, 2000).*

*"... the seamless application of information and communication technology from its point of origin to its end point along the entire value chain of business processes conducted electronically and designed to enable the accomplishment of a business goal. These processes may be partial or complete and may encompass business-to-business, as well as business-to-consumer and consumer-to-consumer transactions" (Wigand, 1997).*

In its simplest definition, any electronic means is used to transact business. As technology advances and Internet use becomes more widespread, e-commerce has come to refer to a wider scope of methods such as e-mail, information websites, on-line catalogues, and product customization. The most common forms of electronic commerce are:

- business-to-business: business selling to other business,
- business-to-government: business bid on government proposals,
- business-to-consumer: business selling to consumers,
- consumer-to-consumer: consumers sell to other consumers via auction sites,
- business-to-employee: business dealing with its employees (West Virginia e-Biz, 2002).

*"... the use of networked computer technology to facilitate the buying and selling of goods and services between trading partners" (Bathia, 1999).*

In the wider context it encompasses the use of information and communication technology in business relations between commercial, manufacture and service sectors. It is about doing business through the Internet by using its standards and techniques (Drakuli, 2000).

All the above-mentioned definitions are meaningful and valid in determining the basics of electronic

commerce. It is a system where all information transactions happen in electronic form through electronic platforms. Buying and selling therefore means a simple click with the mouse, supported by all auxiliary components.

The most appropriate definition would therefore be the one which tends to pure e-commerce, that means with as small an element of off-line activity as possible. It is the one, which completely defines the new era, where the Internet and e-commerce are seen as a major component of global economic activity occurring over the last decade, and where some of the so-called "old economy" segments have suffered significant structural changes (Lynch, 2000).

Electronic commerce is of major importance for the entire supply chain. Thanks to the use of electronic commerce, we can expect considerable cost savings in addition to the time saved and quality improvement. E-commerce can be fully used only if the compatibility of media is assured and multiple data processing eliminated. Furthermore, the e-commerce applications on the buyer's (purchasing) side need to overlap with the distributor's e-commerce applications on its distribution side. Therefore, a demarcation line between e-applications in the purchasing and e-business applications in distribution is almost impossible.

### 3. THE IMPACT OF E-COMMERCE ON TRANSPORT SERVICES

Undoubtedly, e-commerce is already transforming relationships in the transport world through more available information. The information technologies are being increasingly used in transportation services. E-commerce has also stimulated competitiveness among transport service providers, it has enhanced competitive struggle for a better market position.

The usual approaches to organizing the supply chain cannot cope with the cost efficient and dynamic nature of the Internet. Enterprises that wish to use the Internet need to understand its capacity of distribution of basic and complex information, and enable the implementation of transactions in real time. The Internet may direct the supply chain in new ways that were not feasible before this dynamic technology was available. A clear vision, precise planning and technical comprehension of the Internet will enable enterprises to maximise their potential for better management of the supply chain, and as result, to increase their competitiveness.

The impact of information technology on transport has been considerable. Along the supply chain there is a variety of different activities ranging from ordering, invoicing, agency functions, warehousing, shipment, insurance, customs clearance, distribu-

tion and wholesaling to retailing. A long chain where each subject plays an important role. The performance of each subject involves many stakeholders, who have to exchange much information and make payments amongst themselves. It consequently builds complex linkages within a logistic operation where a variety of types of information have been exchanged (UNCTAD, 2001).

*"The availability of information on-line enables service providers and shippers to share real-time information and data. This creates scope for collaboration between them in planning the activities. The easy access to information gives shippers, including small ones, greater power in terms of determining their requirements and in negotiating with service providers" (UNCTAD, 2001).*

Efficient and effective exchange of information between all the parties involved seems to be the challenge of today. Accomplishing this will determine the best possible and sustainable position on the transport and logistic scene.

By accessing a single website, the user will be able to obtain a complete and transparent picture of the action in progress (ordering, pricing, collecting, notifying, delivering, paying).

*"While e-commerce has had a powerful influence on transportation services, the growth of e-commerce itself is becoming increasingly dependent on the ability of transport and logistic services to deliver the goods ordered through the Internet in a timely manner" (UNCTAD, 2001).*

The requirements of e-commerce are not completely satisfied by existing transportation and logistic services. The reason why is simply because while the demand for transport generated by e-commerce has been growing at great speed, there has not been a follow-up growth in the supply of transport and logistics support services. The gap is explained by the following notions:

- the difference between the order fulfilment and logistics requirements for handling e-commerce and those of traditional trade serving industrial supply chains,
- pure on-line retailers tend to lack necessary logistics infrastructure and experience for handling e-commerce. They still need to restructure their internal processes, hierarchies and communications around the demands of digital environment,
- traditional warehouses and other logistics facilities are not suited for e-commerce retail goods (UNCTAD, 2001).

Table 1 shows examples of the range of products or services provided by transport related enterprises through electronic means. The growth of the Internet will certainly foster widespread provision of these services. The greater use of the Internet in transport and

logistics created also a large market for computer software packages.

**Table 1 - Examples of service providers and services provided by electronic means**

Airlines – passenger and cargo	Passenger reservation; ticketing; on-line information on passengers fares; flight schedules; flight connections; tracking of shipments; electronic payment; automated aircraft boarding; baggage reconciliation information.
Shipping lines	On-line information on ship sailing schedules, tariffs, independent action rates and service contracts; rate changes, surcharges; calculation of rates; negotiating rates, sending shipping advice, transmitting booking requests and booking confirmation, sending packing lists, export declaration, shipping instructions, generating commercial invoices, producing bills of lading, confirmation of loading, authorizing payment, tracking of shipments.
Seaports	On-line notification of port tariff schedules; control of shipping traffic, guiding into harbour ships of different characteristics; information on incoming and outgoing ships, information on dangerous substances and safety readiness in relation thereto, information on cargo characteristics, guidance into harbour ships of different characteristics.
Express mail/parcels delivery companies	Processing invoices and shipping labels, notifying recipients of shipment details via e-mail; tracking the status of shipments; on-line information on delivery schedules and routing, prices; delivery schedules; automated sorting of packages; shipping documentation.
Road transport operators	En-route driver information, route guidance, traffic control, vehicle scheduling, electronic payment, on-line price information, safety readiness.

Source: UNCTAD, 1999.

Overall we can say that big technological and organizational changes and developments have been going on in transportation and logistics services while operating in electronic environment. Dealing and understanding them is a hard task to accomplish but undoubtedly a worth one for achieving better capacity utilization.

#### 4. INFORMATION AND COMMUNICATION SYSTEM REQUIRED

Being successful in electronic environment today requires big organizational efforts and financial in-

vestment in adequate technology. The basic task of such up-to-date technology is to provide fast and reliable information flows between parties involved in a certain business operation. There is therefore a need for a good and sound information system.

At the beginning of 90', the branch of logistics had to react fast so that enterprises could survive in the tougher business situations. This was achieved by way of re-engineering the information flow in enterprises, which enabled cost savings, acceleration of production cycles, improvement of the services for users, and generating the competitive advantage. Thanks to new technologies such as electronic commerce, logistical systems and supply chain systems are growing fast into highly efficient business networks.

The availability of inexpensive, heavy-duty and efficient information systems is essential for the transformation of logistical sector. The use of electronic communication provides effectiveness, lower costs and competitive advantages on the basis of re-engineering the information flows between employees and computer systems.

*"The transport industry has gradually grown used to the internet as an integral part of the effort to improve efficiency within the industry. The objective of the business is mainly to establish for shippers and carriers from around the world a center for collaboration to achieve optimal planning and execution of transportation logistics" (UNCTAD, 2000).*

A company has a variety of possibilities in choosing the information and communication system which completely satisfy all its requests. The importance of information and communication technology (ICT) lies in the following facts:

- ICT is becoming a "conditio sine qua non",
- ICT leads to transparency and increased efficiency,
- ICT is an enabler of new concepts (quick response, efficient consumer response, mass customization, lean and agile manufacturing) (Ruijgrok, 2001).

As we can see, the right choice can have a positive effect on business because it leads to increased operation ability and responsiveness in conditions where reactivity is of most importance.

Selecting and implementing new information and communication system and the process changes that go with it, is undoubtedly a complex and demanding undertaking. Regardless of your size and perceived resources, the implementation is not something that should be done without a great deal of careful planning. In order to complete it successfully, a company should pay attention to the following:

- operating strategy should drive the business process design and deployment,
- the implementation should not take a long time,

- pre-implementation activities have to be done properly,
- making sure that your people accept and operate with the new system,
- making an accurate calculation of costs (Donovan, 2002).

The aim of such systems is to support the business processes that enforce the company's strategic opportunities. The system should also act as an auxiliary tool in directing management's actions and decisions. There are some basic tips that should guide the management's actions:

- benefits are a direct result of effective preparation and implementation, and appropriate use,
- no amount of advanced information technology can offset the problem of a flawed business strategy and poorly performing business processes,
- define a business strategy that will give you a competitive advantage or, at the very least, make you competitively equal. Then, analyze your current business processes and develop your objectives. Afterwards the following steps for preparation, software selection and implementation can support your strategic and process objectives better,
- acquire flexible information and communication technology that can accommodate rapidly changing business conditions,
- have the implementation led by a senior executive who has the authority to make changes happen and happen quickly (Donovan, 2002).

While dealing with ICT a few words have to be spent about electronic data interchange (EDI). *"EDI is the inter-organizational, computer-to-computer exchange of business documentation in a standard, machine-process able format. The purpose of EDI is to improve the flow and management of business information, by reducing error due to redundant data entry, and also reduces document-processing time. It is being used for all of the most common business transactions such as purchase orders, invoices, quotes, bills of lading, electronic fund transfer, status report, and receiving advice"* (Arrianto, 1999).

Benefits of EDI are seen as follows:

- reduction in paperwork,
- improving accuracy due to automated processing,
- increasing speed of document transmission,
- reducing clerical effort in data entry and mailing,
- opportunity for proactive contribution by purchasing, because less time is spent on repetitive tasks,
- reducing cost of order placement and processing,
- improving information availability due to speed of acknowledgement and shipment advise,
- reducing workload and improved accuracy in other departments through linking EDI with other systems,

- reducing inventory due to improved accuracy and reduced order cycle time (Arrianto, 1999).

*"The system that has been developed, electronic data interchange (EDI), facilitates the exchange of data through a structured way which has to be familiar to both sender and receiver, through bilateral agreements and processes of standardization of the information systems. The formats have been established by standards organizations. Some of these systems are unlikely to be or cannot be readily integrated into other electronic information systems directly. This tends to limit their application to specific kinds of transaction and to large enterprises and institutions. On the other hand, e-commerce and its main tool, the Internet, are essentially based on non-structured information. This makes it open and accessible to a greater number of users, including individuals. This change implies that a substantially larger volume of transport-related information will be exchanged electronically when compared to the more traditional EDI"* (UNCTAD, 1999). The system explained in the following chapter, the Bolero system is a step further. It encompasses all the advantages that could be gained by using EDI and is also a solution to new mentioned problems.

The management has to bear in mind that building information and communication system in a certain company requires special care. Especially in businesses where reliable information stands for a decisive factor in undertaking activity. Shaping the company's incoming and outgoing information flows in ways that gain speed and reliability would automatically place the company far beyond the competition borders. Only with exclusive differentiation a company can survive in today's business environment. Internet, ICT and special designed/purposed systems therefore enable achieving sustainable competitive advantage.

## 5. BOLERO.NET

Bolero.net is an information and communication system which provides a mechanism for exchange of trade documentation, including transfer of rights from the holder of a bill of lading to a new holder replicating the functions of the traditional paper bill of lading in an electronic environment. It began operation in September 1999 and it is a subscription-based service providing system. Its members trade within the system under a legal framework embodied in the Rule Book, which is binding on them. It constitutes a multilateral contract between them and is governed by the English law (UNCTAD, 2001).

*"The Bolero System is a technological and legal infrastructure to facilitate trade transactions through electronic means. It involves digital information technology to transfer Messages and store certain information, and a legal system of contractually adopted rules to determine*

the effects of certain Messages and updates to the stored information. These Operating Procedures describe the technological aspects of the Bolero System with view to how they fit together with the legal rules" (*Bolero Operating Procedures*, 1999).

"The Rulebook constitutes an agreement between users, and between each user and the Bolero Association acting on its own behalf, and on behalf of all other users from time to time, and, where necessary, on behalf of Bolero International" (*Bolero Rulebook*, 1999).

The Bolero system offers many advantages:

- lower administration costs,
- faster custom services (no need for paper document version),
- lower indemnity demands,
- benefits from operating in such a system are greater than subscription costs,
- it enables business operations unification,
- safety and equal legal responsibilities laid on all system participants,
- transparency and outbound orientation.

"Bolero clearly offers many advantages over paper trading in terms of speed and security. The risks and uncertainties may not be so significant as long as transactions are taking place between those who are members of Bolero and bound by its rules. The situation may be different when interaction with third parties is required or when the cargo is sold to a party outside Bolero and the "switch to paper" procedure is followed. The notion "Switch to paper" is used in cases where the goods are sold to a party who is not member of Bolero. In such cases, the Bolero Bill of Lading is placed in "end status" by the Title Registry and the carrier releases the paper bill of lading, including a statement to the effect that it originated as a Bolero Bill of Lading" (*UNCTAD*, 2001).

As we can see, the Bolero system allows both types of transport documents. The paper one easily replaces the electronic version, if the nature of business operation requires such modality. The logical consequence is that the whole operation is being slowed down and takes more operational procedures to accomplish it.

"The Bolero project also attempts to address the special legal issues that arise when paper negotiable documents are converted into electronic form. In particular, Bolero's initial focus is the use of EDI systems as negotiable bills of lading. The processes used in the project are based on the CMI Rules for Electronic Bills of Lading. The replacing of paper-based international trade documents with EDI messages will result in saving time and costs and also increase levels of security against fraud

and a reduction in the possibility of error" (*Livermore et al.*, 1998).

The most important conclusion could be that all the parties involved could gain commercial advantages from the system. One way is to get benefits from linking the production of the documents very closely to their general applications and get rid of the problem of letters of indemnity when bill of lading paperwork has been slow on the cargo interest side. Another could be that a user will not trust a service like this unless it is truly under his control in some fashion. Bolero system controls the central service, which means equal disposition of any party involved in, and since they are all collective groups of users, everybody feels that they are a part in the development and control (*Nilson*, 1997).

## 6. CONCLUSION

As we could see the Internet-based solutions in today's environment are becoming more and more important daily. Transport services related to concepts of supply chains and the new so-called virtual supply chains are influenced and in a way also fostered by these impacts. Moreover, especially in the last decade, the electronic environment has already been guiding and dictating business operations.

The concept of Bolero.net has been noted in order to explain one way of Internet influence on business transactions. So far it is the most upgraded network system which allows such information and communication connections to transport matters.

Introducing the Internet and other electronic concepts (Electronic Data Interchange, Enterprise Resource Planning, Real-Time Company, Real-Time Information, Virtual Supply Chains ...) in logistics world would certainly cause major structural changes, but will undoubtedly increase efficiency and foster better logistics solutions in order to satisfy customers' needs and requirements.

Even though the guidelines are not so clear and bright, and the scepticism about Internet-related solutions is still too influent, the electronic means already rule our lives. However, as always, it is hard to predict what the outcome will be, but turning away and not facing the reality certainly means losing opportunities. And always only the first movers take the biggest piece of the cake; all the others usually remain with leftovers.

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## VPLIV E-POSLOVANJA NA PREVOZNE STORITVE

### POVZETEK

Vpliv informacijske tehnologije na prevozne storitve ima velik pomen v zadnjem času. Vzdolž oskrbovalne verige se odvijajo različne aktivnosti naročanja, fakturiranja, skladiščenja, odpreme, zavarovanja, carinskega posredovanja ... Dolga veriga členov kjer vsak igra pomembno vlogo.

Učinkovita in hitra izmenjava informacij med vsemi vpletenimi strankami predstavlja v današnjem času največji izziv. Z doseganjem tega bomo zagotovili najboljše in trajnostne dosežke na področju logistike.

Za doseganje uspeha v današnjem okolju je potrebno veliko organizacijskih naporov in finančnih investicij v primerno tehnologijo. Glavna naloga takšne tehnologije je da omogoča hiter in zanesljiv informacijski tok med vsemi udeleženci v določenem poslovnem procesu. Pri tem se pojavlja potreba po dobrem in učinkovitem informacijskem sistemu.

### KLJUČNE BESEDE

prevozne storitve, logistika, oskrbovalna veriga, e-poslovanje, informacijske in komunikacijske tehnologije, medmrežje

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