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Technology and Management of Traffic  
Review  
U. D. C.: 656.615:681.3  
Accepted: Jun. 16, 2000  
Approved: Dec. 12, 2001

## E-COMMERCE IN PORTS

### ABSTRACT

*EDI (Electronic Data Interchange) and electronic business should be looked upon as a natural evolution in the international trade and transport cycle. One of the principal reasons for starting to use EDI are the heaps of documents written, shifted, handled, corrected, transcribed and copied for normal business and administrative transactions. EDI and in general electronic business would have none of the disadvantages of paper documents and have already brought substantial benefits and savings to companies that implement it.*

*Most port community systems today still do not provide for electronic transfer of funds or for electronic interchange of invoices and other trade documents, for instance bills of lading. Such services are specific to e-business and they are the necessary transport-related documents.*

### KEY WORDS

*e-commerce, electronic business, electronic data interchange, globalisation, information and communication technology, international trade, port business*

### 1. INTRODUCTION

Since marine shipping, and specifically port industries, are merely instruments serving international trade, we may say that they soak up changes in the methods and procedures of international trade. Furthermore, international trade can never be completely modernised and transformed unless the shipping industry is suitably adapted, since this is the mode of transport employed in over 80 % of international trade transactions, totalling about 4 billion tonnes a year carried by a world fleet of approximately 80,000 ships [1].

Everyone knows that the world economy is being rearranged; the transformations which are called globalisation are bringing about major changes in trade, and, therefore in ports as well.

Since e-commerce has already begotten a revolution, it is easy to understand its overall significance in the speeding up of cargo transport in general and that of cargo shipments in particular. E-commerce is becoming a golden opportunity for ports that embrace it, and more than a mere threat for those that lag behind.

### 2. PORTS IN THE PROCESS OF GLOBALISATION

The fundamental difference between classic trade and new globalised trade is greater freedom in selecting inputs, location and finished goods services, capital and labour. The globalised economy has accepted competition in the comparable end products and turned it into competition in every type of input and among different end products. Trade in manufactured products has started to require uniform international quality standards and use of electronic communication systems so that prices can be compared for products in the same category manufactured by different vendors, and so delivery times can be optimised.

In the globalised economy, a growing number of manufactured products are no longer produced in one specific country to be sent to another. Instead, manufacturers seek out the least expensive inputs all over the world, and produce and assemble articles wherever they can find the best conditions - whether labour skills or access to end markets. Decisions about sources of raw materials, hiring of labour, plant location, transport systems, delivery times, and distribution channels are all made on a worldwide basis.

The central factor in globalisation is the technological change. Global production and global trade are further stimulated by the plunging costs of international communications of every kind and the increasing opportunities of co-ordinating design, production, and distribution through computer networks.

To accelerate technological change means that investments must yield returns very soon and have longer production series, so that companies are forced to increase or maintain their competitiveness in terms of quality and price, and to be present on all markets.

With these changes, port business is taking on a new role, whereby ports are integrated into the logistic chain by offering new logistics services that add value to the classic ones.

Globalisation and global logistics systems certainly would not be sustainable without an efficient transport network running frequently, and it is also a fact that both globalisation itself and the tools used to im-

plement it have had far-reaching impact on shipping.

Additionally, in order to survive and prosper on a competitive market, ports have gradually had to adapt to their customers' requirements. In addition to port location, competitiveness for ports was traditionally determined by factors such as access to good inland communication infrastructures, availability of docks and suitable merchandise-handling equipment, port-area security, fees, or fast clearance.

This trend is currently changing. We must not forget that international trade requires a buyer and a seller of merchandise. Without exporters and importers, international trade would cease to exist, thus arrangements between these two parties will affect the whole logistics chain and all of its members.

Nowadays, a top-rate port cannot be a mere intermodal centre where merchandise is transferred off ships onto inland-carrying systems or vice versa. Ports have now become an important link in the logistics chain of international transport, enabling door-to-door shipping.

Therefore, ports must not only compete on traditional points, but must also evince effective, high-quality inland connections and added-value services, particularly data-processing, communication systems, and electronic commerce.

### 3. E-COMMERCE IN INTERNATIONAL TRADE

#### 3.1. What is e-commerce

According to the WTO (World Trade Organisation), e-commerce could be defined as the "distribution marketing, sale or delivery of goods and services by electronic means" [2]. While accurate, this definition, however, does not fully capture the spirit of e-commerce, which in practice is far better viewed as a culture, where changing needs and new technology revolutionise the way in which business is conducted world-wide. This cultural electronic transaction in goods, services and exchange of information encompassing business-to-business and business-to-consumers epitomises the practical realisation of the concept of globalisation in the world economy.

E-commerce in business-to-business relations can be also defined as "the use of Information and Communication Technologies (ICT) for radical improvement of business and administrative practices" [3]. But it is not just about technology; it is equally about rationalising and integrating the underlying business processes.

Electronic business (doing business transactions electronically) includes the sharing of unstructured or structured business information by any electronic

means among carriers, forwarding companies, governmental bodies, terminals, service providers and other parties in order to conduct and execute business transactions and administrative or other activities. It is a development of the most rapid advancing technology in present times, namely Information and Communication Technology (ICT). This technology has made it possible to use Electronic Data Interchange together with Internet solutions for data to be exchanged between business applications with minimal human interventions.

#### 3.2. The use of e-commerce in international business transactions

The use of e-commerce in international business transactions is well developed in Europe, in the USA and in many Asian countries, where several sectors, including financial services, travel, music and entertainment, are conducted on the World Wide Web.

The spread of e-commerce is generating many changes in growth and trade patterns, redefining relations among enterprises and reshaping industrial structures as modern business is characterised by increasing snappy capabilities, intensive competition and dynamic customer needs.

This rapid expansion of electronic transactions presents unprecedented opportunity for trade and development for many countries in that it offers the possibility of improved access to the global market, the ability to reach international competitiveness and active participation in the global information economy.

According to the OECD (Organisation for Economic Co-operation and Development), the global value of e-commerce in international transactions was \$725 million in 1997 and it is estimated that it will have grown to over \$154 billion by the year 2005 [4].

However attractive these figures might seem, the direct use of e-commerce in international trade is limited due to an uneven distribution of access to telecommunication facilities especially in developing countries.

Despite the number of open issues regarding security and legal concerns yet to be resolved, it is apparent that e-commerce is happening fast as companies world-wide are establishing basic electronic presence on a global open network and becoming more sophisticated in their use of the technologies.

#### 3.3. E-commerce and the port community

Fully electronic commercial transactions will require all steps and procedures throughout the business relationship to take place via electronic channels, so that ultimately not only will the information be exchanged electronically, but also, and this is the key is-

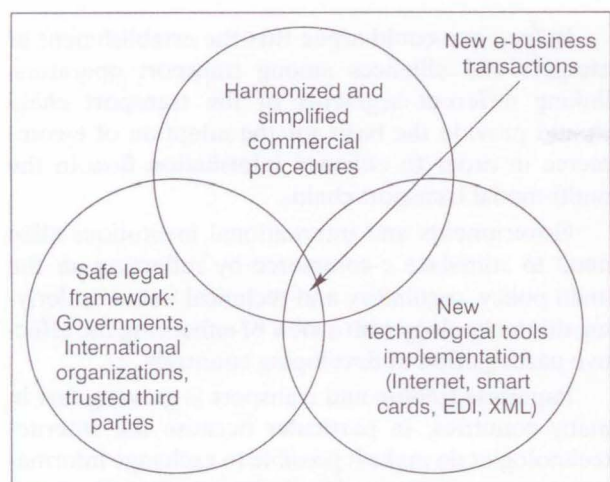


Figure 1 - The three building blocks of e-commerce

sue, the rights and duties will be conveyed in an electronic form.

Before any kind of e-commerce system is implemented in a port community, the aims must be clearly set. A port community comprises many different actors, often with opposing interests, so that this kind of system is very difficult to implement unless the objective is a clear one and shared by all.

It is also important to consider the specific nature of the port environment, in other words, the companies and bodies that play a role in maritime traffic. The main difference between this and other environments is that clear client-supplier relationships are among companies that vary much in size and objectives. Besides, since agents cannot be compelled to adopt any given system, single bodies such as the Port Authority are forced to use paper parallel with computer media, causing greater complexity in office management.

Other important considerations when defining an electronic data interchange system or an e-commerce system include the choice of technology and of administration. Thus, for most European ports with a system of their own, the administrative solution involves shareholders (with the Port Authority generally holding a minority stake). In most cases, the usual technological solution is to implement an EDI clearing centre to serve the community.

#### 4. OPPORTUNITIES AND BENEFITS OF E-COMMERCE FOR PORTS

Today information flows are at a point midway between signed and authorized paper documents which are still often painfully filled in by hand, and the computerized handling of information. Most documents produced by computers are still sent manually to the other involved party (and often re-entered manually into another computer). But the world of the Internet,

e-mail or automatic data transmission, where data is sent from computer to computer with minimal human intervention is rapidly developing.

The timely arrival of information is a vital component in international transport. However, it still happens too frequently that the goods arrive at the destination before the necessary essential information is available to enable the respective operators to perform their function.

Delays in information production and transfer can be reduced, if agreement is reached to make the maximum use of modern information and communication technology, for instance the use of computers to prepare the required documents, sending copies via the Internet, by e-mail or through (EDI) Electronic Data Interchange. And whenever this is deemed impossible the use of Fax and standard aligned documents can provide a solution for simplifying and expediting document handling. However, more needs to be done to facilitate information flows (i.e. how the data are collected, transferred and dealt with). While part of the answer may lie in the simplification of the official and commercial procedures themselves, there should be in addition some systematic way of handling information relevant to the technology available. The advent of electronic trade tools like the Internet and the WWW and the availability of cheap and reliable computers, even in the least advanced countries do offer huge opportunities and many benefits.

##### 4.1. Opportunities for Ports

- a) There could be the opportunity of shipping directly from the manufacturer to the end user, bypassing the traditional intermediary phases of warehousing and retail outlets, thereby realising savings in cost and lead-time in the supply chain.
- b) In fact the whole of the commercial transaction can be operated electronically including order placements, transport and delivery invoicing and payments and exchanges with government authorities such as the customs.
- c) Shipping of consignments is still largely done through the old procedures of fax and phones. However, a great deal of shipping instructions can be transmitted electronically by use of EDI and the Internet based access in order to reduce potential errors and facilitate linkages between suppliers and consumers.

##### 4.2. Key benefits

Some of the potential benefits to ports using e-commerce and other forms of electronic systems include:

- a) Improved distribution: by providing information on the production/supply chain in a timely manner in order to cut down on inventory costs.
- b) Improved efficiency: information relating to cargo manifests, stowage plans and customs declarations could be exchanged by use of the UN/EDIFACT (United Nations Electronic Data Interchange for Administration, Commerce and Transport) and other 150 standards, thereby engendering better control over cargo flows through the port.
- c) Better market access: advertising on the World Wide Web provides the opportunity for greater market penetration and the possibility to compare the services offered by competitors.
- d) Reliable information exchange: the electronic exchange of trade data allows for better planning of reception, stowage and clearance procedures which would be tedious if undertaken manually especially with the advent of 7000 TEU vessels, and the container ship of the future (15000 TEU) vessel on the drawing board.
- e) Expedite clearance-procedures: the use of EDIFACT will expedite cargo clearance process, thus improving port competitiveness in developing new markets and services, which will also generate additional traffic for the Port. Simplification and harmonisation of trade procedures will have direct benefit for ports as transit points within the production and supply chains, for errors in documentation could adversely affect overall efficiency and terminal operations. The streamlining of customs documentation could also significantly reduce the dwelling time of cargo in ports, thereby reducing overall transport costs.

## 5. CONCLUSION

It is apparent from the foregoing analysis that e-commerce will virtually influence both the volume and the nature of international commercial flows. It is therefore safe to state that e-commerce is the first global manifestation of the financial impact of the information revolution in the manner that it bridges the space gap and time difference between the centres of production, supply and consumer markets.

In fact, with the advent of multi-modalism and the concept of door-to-door service, the impact of electronic commerce on ports as links in the production and supply chain becomes more and more pronounced.

The handling of cargo from production to markets is thus inextricably linked through information systems that provide accurate and reliable data at any stage within the transport and distribution system

In fact, one could argue that the establishment of mergers and alliances among transport operators, linking different segments of the transport chain should provide the basis for the adoption of e-commerce in order to enhance information flow in the multi-modal transport chain.

Governments and international institutions alike need to stimulate e-commerce by reflecting on the main policy, regulatory and technical issues underlying this technology with a view of enhancing the effective participation of developing countries.

Paperless trading and transport is growing fast in many countries, in particular because the Internet technologies do make it possible to exchange information in an easy way worldwide introducing other concepts such as »just-in-time« and consolidation of consignments. This usually means more and other, maybe smaller, shipments with very tight delivery schedule that paper documents cannot cope with. EDI and Electronic Business should be regarded as a natural evolution in the international trade and transport cycle. One of the principal reasons for starting to use EDI is the mountain of paper documents produced, shifted, handled, corrected, transcribed and copied for normal business and administrative transactions. EDI and in general electronic business have none of the disadvantages of paper documents and have brought substantial benefits and savings to companies that implement it.

Accuracy (data are received directly from computer files and are not re-entered manually), speed and savings (it saves on the cost of mailing, copying, filing, distributing and capturing data) are some of the advantages.

It is obvious that replacing paper documents by EDI messages does not change the basic business and governmental requirements in international trade transactions. The same fundamental functions should be fulfilled, and through EDI and other solutions such as e-mail the parties will still be sending and receiving general declarations, cargo declarations, crew lists, passenger lists, stores lists, personal effects lists and dangerous cargo declarations. However, the implementation of electronic-business solutions will undoubtedly lead to different processes and procedures. In some countries, this may necessitate changes in law and regulations, e.g. for permitting the substitution of traditional paper documents, Customs declarations, etc. by electronic messages, or for giving such messages the same legal value as that of a paper document.

The World Wide Web offers opportunities that are available to any party with access to the Internet. Possibilities such as web form arrangements make it possible, for instance, for agents to fill in and file the so called E-Forms in advance with the appropriate au-

thorities in the relevant port which would already mean a great step forwards for quite a few medium and small size enterprises. Obviously, the best way to move forward is to harmonize with and standardize the electronic form. The Internet technology such as XML (Extensible Markup Language) will enable the exchange of structured documents over the Internet, yet it is of utmost importance that the layout and the contents of these documents remain clear and in line with the IMO FAL recommendations [5]. XML offers possibilities for the exchange of data from computer application to computer application or to persons. XML offers more capabilities than its sister HTML (HyperText Markup Language), but standards must be agreed upon and used for the DTD (Document Type Definitions) and the required tags to make it into an easy tool that can be used by, for instance, ships, ports in transitional countries, in container depots and SME's (Small and Medium Enterprises).

#### **POVZETEK**

#### **ELEKTRONSKO POSLOVANJE V LUKAH**

*Računalniška izmenjava podatkov (RIP) in elektronsko poslovanje sta v mednarodni trgovini in transportu posledici*

*naravnega razvoja. Možnost, da se izognemo kopici papirjev, ki jih je potrebno v normalni poslovni transakciji napisati, prenašati, popravljati, prepisovati, ipd., je eden glavnih razlogov za uporabo RIP sistemov (EDI sistemov). Slednji v elektronskem poslovanju popolnoma nadomestijo papirne dokumente, prinašajo pa tudi obilico pridobitev in prihrankov.*

*V večini luk, zlasti manjših, elektronski prenos oziroma izmenjava poslovnih dokumentov, kot so računi, tovorni listi, idr., danes še ni mogoč. Izvajanje storitev, ki so značilne za elektronsko poslovanje, je v času globalizacije za vsako luko ne samo potrebno, ampak tudi nujno.*

#### **LITERATURE**

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