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INFORMATION MANAGEMENT FOR CONTAINER LINE

Case study for container line of Lithuanian shipping company (LISCO) between ports in Lithuania, Belgium and Germany

By

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DECLARATION

I certify that all the material in this dissertation that is not my own work has been identified, and that no material is included for which a degree has previously been conferred on me.

The contents of this dissertation reflects my own personal views, and are not necessarily endorsed by the University.

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ABSTRACT

Title of Dissertation: **Information management for container line. Case study for container line of Lithuanian Shipping Company (LISCO) between ports in Lithuania, Belgium and Germany.**

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The dissertation is a study of information management in today's shipping industry, analysing the developments of information technology (IT) and its effect on the functioning of the shipping industry and LISCO in particular.

A brief look is taken at the need for information in shipping and general sources of this information are identified.

The need for proper management of information is examined and the developments in the areas of electronic data processing (EDP), electronic data interchange (EDI) and Internet were analysed.

Due to the rapid developments in the information technology, there are new opportunities and threats arising every moment. A number of international projects are looking at the legal and technical aspects of these developments and the study conducted has identified and analysed the biggest problems related to the shipping industry.

The example of the way information is managed in the real shipping company and its container line is based on the case study for the container line of the Lithuanian Shipping Company.

Finally, the summary of findings and the recommendations on how information management in the LISCO Conline can be improved are given.

KEYWORDS: Information management, Information technology, Container line, LISCO, EDI, IT.

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LIST OF ABBREVIATIONS

ANSI	American National Standards Institute
APL	American President Lines
B/L	Bill of Lading
BLG	Bremer Lagerhaus-Gesellschaft AG & Co
CIS	Commonwealth of independent states
DOS	Disc Operating System
EDI	Electronic Data Interchange
EDIFACT	EDI for Administration, Commerce and Transport
EDP	Electronic Data Processing
ESCAP	Economic and Social Commission for Asia and the Pacific
EU	European Union
IFTM	International Forwarding and Transport Framework
ISM Code	International Safety Management Code
ISO	International Standards Organisation
IT	Information Technology
KLASCO	Klaipeda Stevedoring Company
KSSA	Klaipeda State Seaport Authority
LAN	Local Area Network
LEOs	Low Earth Orbit Stations
LISCO	Lithuanian Shipping Company
MARIS	Maritime Information Society
Mb/s	Megabits Per Second
MIS	Management Information System
OOCL	Orient Overseas Container Line
PC	Personal Computer
PHARE	Programme of assistance to the future member-countries of the EU
PROSIT	Promotion of Short Sea Shipping and Inland Waterway Transport by use of Modern Telematics
QA	Quality Assurance

ROE	Return On Equity
Ro-Ro	Roll on - Roll off
S.W.I.F.T.	Society for Worldwide Interbank Financial Telecommunication
TEU	Twenty feet Equivalent Unit
UNCITRAL	United Nations Commission on International Trade Law
UNCTAD	United Nations Conference on Trade and Development
UNGTDI	United Nations Guidelines for Trade Data Interchange

Chapter 1

INTRODUCTION

Information management is one of the essential success factors in the extremely competitive market situation in the shipping industry. This in particular is true for the container lines. The activities such as container management, freight management, processing of port formalities all rely on timely, accurate and sufficient information. By having proper information management strategies, systems and equipment, shipping line operators can reduce costs of order processing, container tracking as well as minimise ship and container turn-around time in ports and hinterland, respectively. This, consequently, should lead to improved services for the customers and competitive strength for a company.

Lithuanian Shipping Company (LISCO) has been in the Ro-Ro liner market of the Baltic Sea from 1982. In 1998 its first container line, LISCO Conline, between the ports of Klaipeda, Antwerp and Bremen/Bremerhaven was opened. The line seeks to establish itself in the feeder service market between the main European hub ports and the ports of the Eastern Baltic. This is already a very competitive market and the future success, or maybe even survival, of this new line largely depends on how the company will manage to keep the total costs to a minimum level and to satisfy customers' needs. One of the ways to achieve that, is to base all decisions on reliable information, which can be provided only by having an efficient information management system.

In this paper, the author tried to look at the information management and developments of information technology and how they affect the shipping industry, as well as to look at the way information is managed in the Lithuanian Shipping Company.

In doing that, chapter two was dedicated to an analysis of general aspects of information in shipping. This included the analysis of the need for information in shipping and the sources of that information.

The information flow in shipping is an expensive item in the total cost of transportation and, consequently, the goods. Studies suggest that the use of paper documentation increase the cost of goods by 5-10%, which amounts to 350 billion US dollars yearly. These costs can only be reduced by efficient information management. Therefore, in chapter three an analysis on how information is managed in today's shipping industry was made.

Furthermore, there is a need to say that the industry of Information Technology (IT) is a very young one, which means associated rapid developments and consequent legal problems. Chapter four is devoted to look at these issues.

As was mentioned above and is indicated in the topic, the author also intended to make a case study of how information is managed in the Lithuanian Shipping Company and its container line. Therefore, chapter five introduces the company and its line.

Chapter six is devoted to look at the way information is managed in LISCO Conline. Due to the fact, that ports are the hubs and, very often, bottlenecks of the cargo flow, port information systems are very important links for the overall information management of any shipping line. The information management by the other parties involved in the line's operation is equally important. Therefore, the information management infrastructure, strategies and plans for LISCO, its container line's agents and the ports of call are also analysed in chapter six.

Finally, chapter seven is dedicated to the summary of findings and conclusions.

The research was mainly done through the analysis of material available in the maritime press and relevant Internet sites. The problem with the chosen topic is the rapidly changing environment, which had to be described. The information

technology is changing very rapidly, when new innovations appearing every day. Further problems were due to the very broad range of factors, which affect information management. These include developments in communication and technology, legal issues, managerial problems and different areas of application of technology. One difficulty was also the fact that there was little research done and available on the topic, which is basically due to the mentioned rapid developments in technology, which changes the ways information is managed.

Due to the above-mentioned constraints, the author has tried to limit the analysis to looking at the information management in the commercial and administrative side of the shipping industry. By analysis of information, mainly available in maritime media, the most recent developments and trends were identified and analysed. The attention was concentrated on the issues relevant to container lines, but some developments, which are likely to affect shipping industry in total, were also considered.

Chapter 2

INFORMATION IN SHIPPING

Information has played an important role in the shipping industry since the establishment of merchant fleets. The Lloyds' of London was established on the basis of a small coffee-house in the centre of London, where shipowners and merchants met to exchange information and to make decisions about insurance cover. Moreover, the owner of the coffee-house, Edward Lloyd, started to collect gossips, information and publish it on a small sheet of paper – the predecessor of today's most important shipping daily newspaper "Lloyd's List". Since then the size of the world fleet and trade has expanded enormously, and so has the information flow.

It is known that growth of ships' tonnage has a direct relation with the growth of world seaborne trade. As can be seen from the graph below (see figure 2.1) the rate of growth of world seaborne trade during the last one and a half century and even in the last century was very unequal.

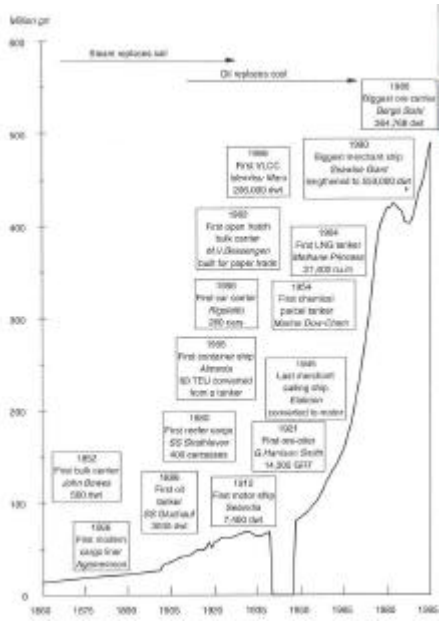

Figure 2.1. Growth of World Seaborne fleet.

Source: Stopford, 1997, p. 20

The rapid growth in the second part of the 20th century was a consequence of natural developments in technology, efficiency and trade. However, one of the main factors should have been developments in the communication and information technologies since growth of communications almost exactly repeats the developments of seaborne trade or vice versa (see figure 2.2)

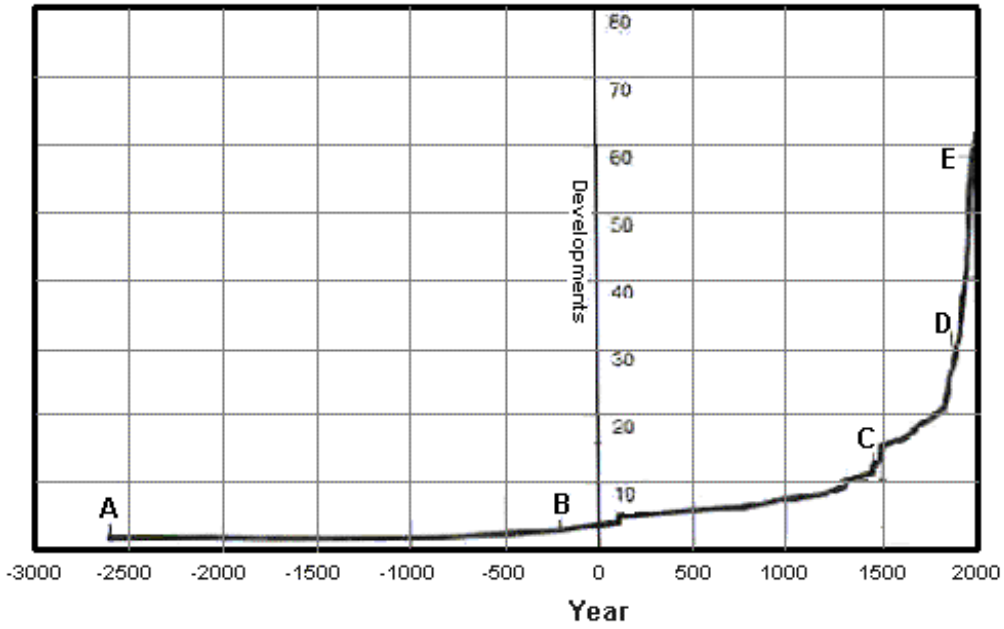

Figure 2.2. “The onward march of communications through time”

Source: Lee, 1997.

These developments became of essential importance with the change in the structure of cargo consignments, which have increased in number from one full ship-load up to 7000 loads/containers per ship. Containerisation has led to an increased number of shippers, receivers, transactions and, consequently, the amount of information and documents related to one ship. Moreover, all this increased flow of information has to be processed more quickly, since the turnaround time of ships in ports has decreased to several hours to discharge and load a fully containerised ship.

Communication, exchange of data and electronic data processing (EDP) are the three core components of the information technology (IT). As Drewry consultants note (1998) “...commercially and operationally these are core components of shipping

industry" today as well. That is why the developments in the IT had and still have a big effect on the services, efficiency and the way work is performed in today's shipping industry.

There are a number of individuals, organisations, authorities and other entities involved in the cargo transportation chain and their business, services or duties rely on information. Therefore, the following chapters will discuss the different aspects of the need for information.

2.1. Need for information

The number of players active in the process of transportation of goods in liner trade are the sources, users or analysers of information. The following graph (see figure 2.3.) shows the flow of interaction between different parties in container transport. The legal and commercial relations between those parties are the two most important factors that determine the need for information.

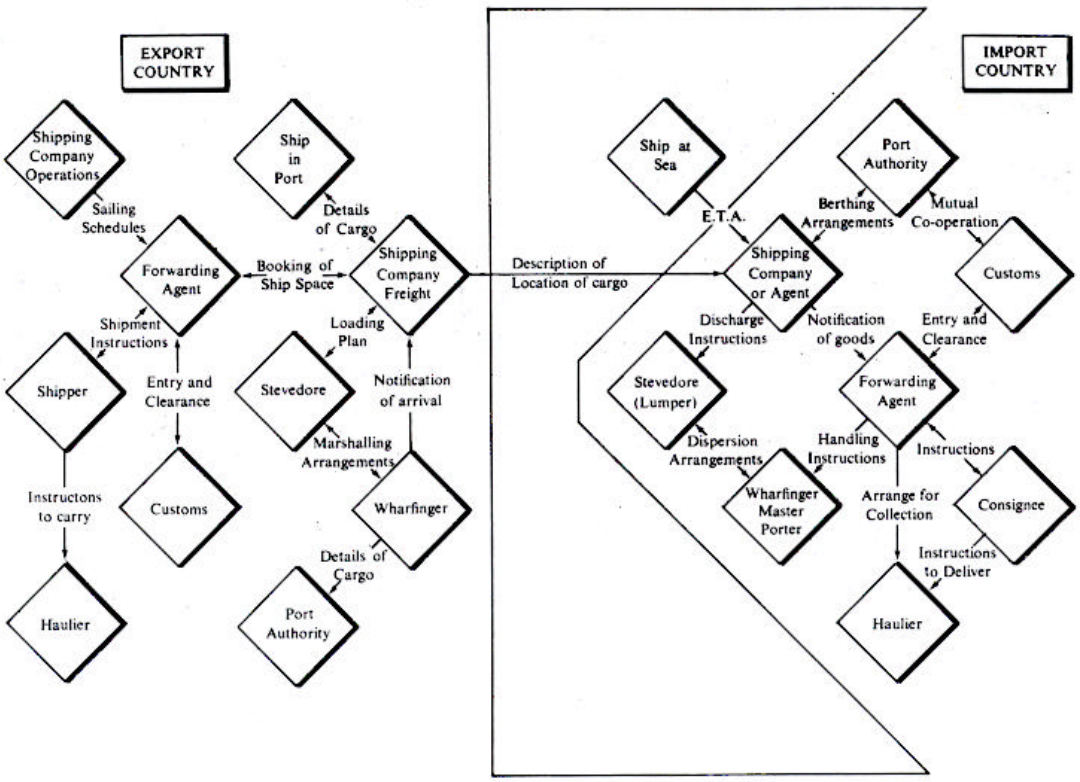

Figure 2.3. Communications in cargo handling.
Source: UNCTAD, 1989

2.1.1. Legal aspects

There are two main aspects of the need of information from the legal point of view, which are governed by administrative and contractual law.

- Administrative law

The public administration of the State has many duties, which can be broadly divided into regulatory and service-providing. Under the first item, the most important is the provision of the regulatory framework for any activity and business in particular. By doing that, governments and parliaments adopt primary legislative acts, which are then implemented by the setting up of rules and regulations. Consequently, those rules and regulations form the basis for the need for information. An example of it could be the requirement to provide statistics, to document all activities, rules of book-keeping, licensing, providing the authorities the documents for cargo and ship clearance.

One of the main problems associated with rules and regulations arises when authorities start to require too much information. There is no question about the importance and need of information for the government of the country. Nevertheless, every government should be very cautious when adopting any act, rule or regulation that requires information from the commercial sector - over-requirement may have a negative impact on the country's economy. With relation to international trade and transport, the most sensitive area are customs' procedures and regulations, which often is a major obstacle of international trade (UNCTAD, 1995, page 73).

- The law of contract

Contractual law governs another aspect of the legal side for the need for information. "Contractual obligations, although they are restricted by many legal rules, are a kind of law peculiar to the parties and only enforceable, by means of an action for damages or otherwise, between the parties." (Donner, 1998, page 41). In order for

the contract to exist, there should be a number of conditions met and one of them is that all terms should be agreed. This includes all possible clauses regulating duties, responsibilities and liabilities of the contracting parties, as well as procedures of loading, notifications, payment of freight or hire, etc.

Even though the principles of contractual law do not require the information to be put into writing, most of the agreements are put into writing. This practice is reasoned by the practice of courts, where it is very difficult "...to prove what was agreed if (or rather when) the parties subsequently cannot agree on terms of the agreement" (Donner, 1998, page 44). In addition, there could be specific statutory requirements for a written contract.

2.1.2. Commercial aspects

The information need for commercial purposes is obvious. Long term planning, market forecasting and operational matters arising between involved parties are all sources of need for information. Information for commercial purposes can be subdivided into three aspects:

- **Information to measure companies' performance (looking backwards)**. This mainly involves auditing functions and financial auditing in particular. In addition, this is now increasingly applied to the processes and procedures of operations looking mainly for the compliance (Mottram, 1999, page 2). In order to be able to do this, all kinds of commercial information should be gathered and processed, so that meaningful reports can be produced, which then would allow to make reasonable assessments of companies' past performance. Reports mentioned could be balance sheets, cash flow accounts, expenditure and others.

- **Information to support long term decisions (looking forwards)**. This is information, which is needed to develop the strategy of an organisation, which by itself should aim for the best use of the recourses of the organisation - including people - in meeting opportunities which are or could be available. Development of

the strategy is followed by the alignment of the organisational structure, which should ideally follow the strategy. All these involve risks for the company, which can be minimised by having reliable information about the company's performance, market conditions and trends as well as developments of new technologies.

- **Information to support operational decisions** (prices of supplies, currency rates, etc.).

All these involve a huge amount of information, which is generated, received and should be processed in a shipping company. In order to manage all this information flow one should identify the sources where information is coming from.

2.2. Sources of information

As was emphasised above there is a big flow of information in the shipping industry. There are many generators of information, which can be divided into the following groups.

2.2.1. Ship information

This group of information includes all information related to the ship. As soon as the ship is built she starts to generate information, which should be recorded, analysed and taken into account. It is a responsibility of the shipowner/manager to monitor his ship and, in order to make informed decisions, he has to have as much information about his ship as possible (Lee, 1997, p. 6).

- Performance indicators

A ship has an average life span of 25 years, during which wear and tear of equipment makes a big effect on the cost of maintenance, fuel consumption, speed, carrying capacity and other factors of performance. Therefore, it is of essential importance to follow these parameters.

- Costs

All ship related costs are factors, which affect the overall performance of the shipping company. The two main factors are cost of fuel and cost of labour, both of which account for up to 30-60 percent of the ship's total running costs (Stopford, 1997, pages 160-163). In addition, proper management of information about prices of supplies in different parts of the trading region can give considerable savings to a shipping company.

- Supplies and equipment

Management of supplies and equipment is one more challenge for shipping companies. By having proper information on inventory stocks it is possible to utilise exchange of existing stocks on board different ships, which, again, can give noticeable savings to the company.

- Voyage information

During the performance of the voyage a ship generates information, which should be transmitted to the ship owner, cargo owners, agents, etc. This includes items related to ship safety, such as ship position, speed, remaining fresh water and bunkers, weather and see conditions, cargo status, deviation from the common route, accidents, ISM and other reports.

Those are the major items of ship information. The problem with the ship-board information is the communication of it to the office. From a technological point of view, today this has become easier than ever before, but still it is a costly item on the ship owner's profit and loss account.

2.2.2 Office information

Apart from the ship, on which all activities are targeted, the ship owner's office is another big source of information. The size of organisation has a relation on the amount of internal communication (and information) and this needs to be addressed

in order not to interfere with important commercial information. Nevertheless, this source of information is an important item in the work of an organisation and includes the following items:

- Financial data

Tracking of financial data is very important for any organisation. Every activity in the company has financial implications, if not costs, so they should be identified, recorded and analysed. The financial department of an organisation has a duty to do it on a day to day basis and present to management the result of analysis weekly, monthly or at any other interval set by them. Big sources of financial information are salary payrolls, bank transactions, financial expenses such as interests and loan repayments, ship supply, etc.

- Personnel data

Personnel management is another source of in-house information. The present trend is to out-source this activity to specialised crew agencies, but the lack in supply of officers requires the companies to keep its own pool of employees. Apart from that, shore staff will always be on the in-house management. Therefore, information on personnel employment background, contact information, social security data and other information should be recorded and managed. As was emphasised by one Greek shipowning company, apart from normal activities, extensive records of information on each employee gives the possibility for the management to see his (or her) habits and have better control, which has a positive effect on costs.

- Inventory control

Inventory of different ship supply items is a big source of data. This is particularly true for the container lines, where containers are the biggest and most expensive items in the fixed assets of the company after the vessels. Normally, each container ship has three sets of containers, one being located on board and the other two in the hinterland of ports of loading and discharge. The main two items in the information

on the containers are data about the position of each of them and data about the damages caused, if any. Continuous monitoring of container status has become a norm for liner shipping companies, which now even provides the possibility for shippers to see the position of their containers in real time (see chapter 3.2.3).

- Quality assurance

Recent developments in international maritime legislation as well as increased competition between shipping companies led to the implementation of quality assurance systems in many shipping companies. The two most common now are the International Safety Management (ISM) Code and ISO 9002. In addition some of the companies have implemented the new environmental quality standard ISO 14001. The two basic principles of all the QA systems are "...say what you do, do what you say" and continuous improvement. This means documentation of all activities of the company, development of procedures and continuous review and improvement of those. Subsequently, this gives additional amounts of information, which any company should analyse and manage on a day to day basis.

2.2.3. Trading information

There is a continuous flow of trading information to, from and within a shipping organisation. This includes a number of documents produced for commercial, administrative or legal purposes such as bills of lading, booking notes, offers, fixtures, invoices, etc. In addition, trading is led by intensive exchanges of oral information with customers, suppliers, agents, brokers and between employees.

2.2.4. Market information

In order to reduce the risks of wrong decisions, there is a need to know what is going on in the market, which is important to any shipping company, and in the world in total. Therefore, other sources of information should be found, which may give the possibility to asses the trends of the market and notice arising opportunities. Sources

of such information are ship brokers, media, stock markets, Internet, personal contacts, etc.

- Ship Brokers

In many cases ship brokers are working with many ship owners and other brokers, and, thus, have the possibility to see what is going on in the market. One of the main services ship brokers provide for their customers is supply of information and advice on market trends. This is done by means of market reports as well as personal communication.

- Media and Internet

Another important source of market information is media and Internet. In fact, today Internet is more and more often used to access media (newspapers, radio, TV) and in addition it gives the possibility to reach other sources of information such as e-mail, discussion groups, video conferences and even databases of different organisations and partners.

2.2.5. Legislation and regulations

Shipping activities are international by nature. Therefore shipping companies are affected not only by national laws, but also by laws of other countries in which the ship is calling as well as by international regulations. This gives another source of information, which shipping companies have to assess and follow up.

Chapter 3

INFORMATION MANAGEMENT

3.1. Need for information management

The value of information can be only realised when it is used and actions are taken based on information provided. Such information is considered as management information and defined as:

> "...processed data supplied to various functions and levels of management as an aid to the efficient planning, co-ordination and control of business operations and as a basis for making sound decisions" (UNCTAD, 1989, page 2)

This is possible only with a well-established management information system (MIS). The main values of such a system should come from the actions which:

- Increase the present and future efficiency of the organisation
- Utilise resources more effectively
- Reduce cost
- Increase profits
- Monitor the attainment of objectives (UNCTAD, 1989, page 2).

To make decisions, which transform into the above-mentioned benefits, managers should have support from the system that presents the information in the most suitable way. As was emphasised in the previous chapter, there is a huge information flow in the shipping business and all this information is (or should be) important for one decision or another. The problem arises, when too much information finds its way on to the Chief Executive's desk. A system should be developed, which

regulates the flow of information and presents it in different forms for the managers of different levels. The basic principle should be that "...as information is passed up the management pyramid - some details may be omitted and detail reports cut down in size and their frequency of issue be reviewed to essential time limits". (UNCTAD, 1989, page 2).

Apart from the in-house needs of information, there is a growing demand for proper information management from the customers' side. Customers require a smooth process of transportation that support the achievement of their business objectives (Drewry, 1998). With the just-in-time processes, delivered by the increased efficiency and developments in containerised liner trade, customers now require more and more precision in delivery time. This can only be achieved with the smooth flow of information and, consequently, cargo. During the transportation, information needs to be accessed, handled and processed many times over (manufacturer, inventory, purchasing, accounting, treasury, buyers, suppliers, banks, carriers, freight forwarders, brokers, agents, insurance, customs, etc.). In traditional trading this involves a number of data re-keying, which is the biggest shortcoming of the paper-based systems. "Studies suggest that as much as 75% of all re-keyed data contain errors" (Lloyd's List, Oct. 3, 1995). The way to eliminate mistakes, to ensure data integrity and, thus, to avoid delays, is to handle the data one time only. This can only be done by moving from paper systems to electronic data interchange (EDI) and processing (EDP). In addition, greater accuracy means less queries, freeing resources for other tasks, which, consequently, maximises staff effectiveness, either by improved customer service or by increased business done with the same number of staff (McDonnel, 1991).

Another factor to consider for the need of information management, is the costs involved in those processes. It has been estimated, that costs of administration absorbs up to 7% of the value of international trade (Drewry, 1998). Another study concluded that the use of paper documentation increases the cost of goods by 5-10% and the total amount of money involved in the processing of paper documentation is

estimated to be up to 350 billion US dollars per year. Apart from that, potential cost-saving benefits for the shipping companies themselves should be sufficient stimulus for adopting new ways of information management. This is particularly important in view of the continuous downward trend in the freight rates and profit margins for such companies (UNCTAD, 1999).

3.2. Information and communication technology

There is no requirement that information management should be performed by the use of computers and electronic data processing (EDP). In fact, information management existed well before computers were even invented (UNCTAD, 1989, page 2). In addition, not all information can be manageable with the use of information systems, for example, information that every manager obtains orally through meetings, one-to-one discussions and telephone calls. Such information tends to be fragmented and "soft" that makes it very difficult to manage in a systematic way (Finlay, 1989, page 8).

Nevertheless, the tools that are provided by information technology (IT) and the potential cost saving involved, should be utilised in order to reach efficiency and competitiveness in today's market. The main components of information (and communication) technology, which already exist or are likely to be introduced in the near future, are:

- "electronic computers and, particularly, personal computers with increased capacity and performance and containing microprocessors and enhanced memory storage capacities;
- wired and wireless telecommunications;
- software for information storage and processing, communication interfacing and systems operations;
- (…) other technologies including cash cards to store money electronically, smart cards containing microchips encoded with various classes of confidential

information, mobile video-phone communication services and electronic notepads with voice and handwriting recognition" (ESCAP, 1999).

The main benefits achievable by the use of information technology are:

- Increased productivity and quality
- Lower costs
- Faster processing of data
- Reduction of errors
- More event-controlled status monitoring
- Faster customs clearance
- Better data protection (dbh Bremen, 1999).

The shipping industry is considered very conservative and resistant to change. Most of the operations today are performed the same way as they were done in the 18th century. This is considered to be because of the fragmentation of the industry and the above mentioned poor profitability of many shipowners (LSE, Jan, 1999).

Nevertheless, the changes in technology and technology awareness are shifting the industry towards new approaches for the services offered to the customers. This is particularly true for the liner industry, which always was at the forefront in adopting new technologies. "The liner industry has been exploiting EDI technology for a long time and container companies can no longer use it for competitive advantage but instead must use electronic links with their customers to remain competitive" (LSE, Jan, 1999). Despite that, many small or medium sized feeder companies, who want to serve niche markets, still have to make steps towards new technology in order to survive in today's market.

3.2.1. Electronic Data Processing

At the beginning of electronic data processing (EDP), this term was used to describe different means of managing data with the use of electronic devices. Depending on

the amount of data, financial capability of the users and other factors, EDP was performed with different means from electronic calculators or microcomputers to large mainframe computing systems.

As was mentioned above, the shipping industry is considered to be resistant to new technologies. Nevertheless, many shipping companies have developed their own EDP systems with the beginning of computerisation. For example, American President Lines (APL), developed their first mainframe version of the so-called Import Information System in the mid-1980s (APL, 1996).

On the hardware side, today practically all data processing is done on the ordinary PCs and/or more powerful PC based servers. The price of such systems is much lower than comparable large EDP systems developed on the basis of mainframes, which were affordable only to large shipping companies. Today, every company or small shipping agent has at least one PC in their office. The rapid developments on the hardware side of IT have created a downward trend of prices and up-ward trend of efficiency and capabilities. This makes the technology accessible to more and more users and gives the power for more advanced IT software solutions.

There are two main types of IT systems used in shipping companies - in-house systems and systems developed by specialised IT solution providers.

- **In-house packages**

Discussions are going on regarding the different advantages and disadvantages of having an in-house package or market wide software and hardware solutions, and different companies have different opinions. For example, the General Manager of Anangel Shipping Enterprises sees that having an in-house tailor made system is a necessity, because their "… needs are different from others" (Platsidakis, 1999). The company has two IT experts working on development and maintenance of the system. The same approach is taken by CERES Hellenic Shipping Enterprises, which has developed an in-house system on the basis of Lotus Notes, IBM DB2 databases and IBM AS/400 server platform. Ceres' senior vice-president/MIS communication

manager Mr. Nick Finidis emphasises that such a system helps them to maintain the highest standards of operation, safety and efficiency, which fits very well with the guiding principle of the company, which is customer satisfaction (Lotus, 1998). It would be true to say that most of the industry's leading companies have developed some kind of dedicated in-house system. The systems are often based on the mainframe technology, since at the time of development, it was the only option.

There are a number of reasons, why big shipping companies keep using their in-house systems and teams of IT experts, even though, there are many attractive and more cost efficient solutions developed by the specialised IT solution provides.

One of the reasons is the investment made when there were no specialised systems, or the ones available did not met the requirements of a company. Today, the change of the system from, for example, a well established mainframe system to more advanced client/server architecture based systems might be extremely expensive.

Another reason is the question of reliability, i.e. maintenance and support of the system. The developers of the in-house information management systems are always closer to a problem if one should occur. The need for timely problem solving, lack of understanding of local requirements as well as of shipping matters keep shipping companies from out-sourcing the IT functions. In most cases it would make good business sense, but the risks are considered to be too high (Fairplay, 1999, page xx).

In addition, the rapid developments in the IT require to keep up with the changes. In order to gain competitive advantages companies look very close to opportunities as they arise. For example, Internet gives container shipping lines the opportunity to reach new customers or provide new services to existing ones (see 3.2.3).

- **Other software**

The number of specialised software packages for the shipping industry that has been developed during the last years has increased to 1246 in 1999 (see figure 3.1.). This shows the potential of the market. Furthermore, due to the availability of increasingly

sophisticated off-the-shelf software packages, there is less need and little economic justification for having a team of in-house software developers (Fairplay, 1999, page xxiii).

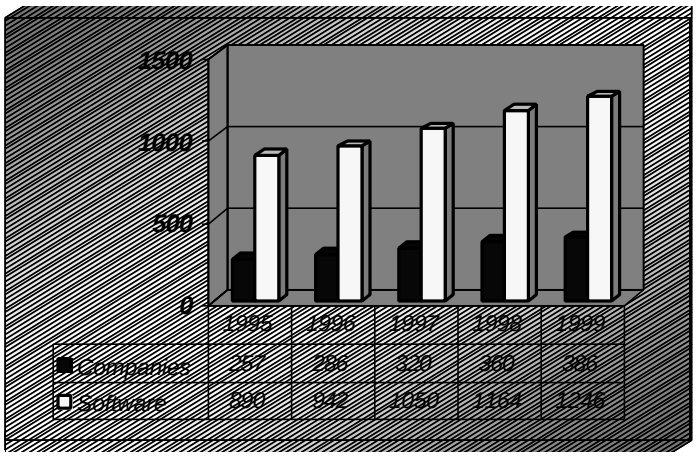

Figure 3.1. Growth of Maritime software providers and software packages.

Source: Compiled from Fairplay Marine Computing Guide, 1995-1999.

Outsourcing of the IT services of shipping companies may seem justifiable because of the general advantages of outsourcing. Specialised companies can have benefits of scale economies, speciality, complexity of the work as well as being more efficient due to competition and core business considerations (Ma, 1998, page 15). The outsourcing of the IT functions is of particular advantage to small companies, who simply could not afford having in-house systems and its own support team.

Apart from that, there are other advantages of having IT solutions from other sources. “Ease of use is one reason for preferring ready-made programs, which are likely to be well tried and tested” (Fairplay, 1999, page xxiii). Furthermore, Fairplay (1998, page iv) noted the advice by one industry executive to use systems and software that are developed for business requirements similar to many industries. Because of the bigger world-wide use of such systems, they would be even more reliable and up to date.

3.2.2. Electronic data interchange

Apart from the basic data processing, computers may be inter-connected between each other to a Local Area Network (LAN), which gives the possibility to exchange data electronically between different users. Moreover, if the connections are extended to the business partners and customers the system may become fully "paperless" removing all shortcomings of the traditional paper-based systems and giving benefits such as:

- Savings in clerical costs by avoiding data re-entering
- Avoidance of manual errors in re-entering data
- Avoidance of errors in transmission of data
- Improvement of information management
- Facilitation of just-in-time ordering, manufacturing and delivery
- Quicker processing of invoices and facilitation of speedy payments, thus improving cash flows
- Facilitation of faster border controls and Customs clearance of goods (Donner, 1999, page 3).

A real move toward such approaches has started in the mid-nineties, when major corporations, having previously developed in-house EDP systems, realised that a global system, which made it possible to talk to customers and suppliers was essential (Macleod, 1991). Mr. Mark McDonnell (1991) gave a good description why the transportation industry needed EDI in his article in Lloyd's List "EDI in trade, transportation and shipping". He sees three main reasons:

> "First, the customers within the transportation industry are already using EDI[1] to tighten the logistics of their UK supply chain; now they are looking to extend this to their international transportation chain too.

[1] In 1991 (A.D.)

> Second, EDI is a 'win win' situation where inefficiencies are squeezed out of the supply chain entirely. Thus shippers, freight forwarders, carriers, customs and so on can all benefit from reducing cost in their operations and improving customer service. (...)
>
> Third, nowhere in business does the same data - consignment data - change hands so often, requiring repeated re-keying at every stage of the transportation chain. This introduces costly delays while queries arising from inaccuracies through keying errors are resolved."

Despite the advantages of implementing and using EDI, the associated costs of implementation and "... the inherent difficulty in getting people to agree on communications standards has meant that in most markets, EDI has singularly failed to live up to expectations" (Lloyd's List, March 22, 1994). The lack of a common standard during the first stage of implementation of EDI systems led to a number of technologies developed and used to exchange data between two or more companies and their subsidiaries. In fact, there was a number of standards developed and agreed on a regional basis, such as ANSI X.12 (American), UNGTDI (European), IFTM, Cargo-Imp, EDIFACT. The last one, EDIFACT, stands for Electronic Data Interchange For Administration, Commerce and Transport and was developed by the UN-approved EDIFACT Board, aiming to set the global standard. This standard succeeded in becoming the most used global standard, but it failed to bring most of the needed benefits at the early stage because:

- It was developed too late from the point of view that many major companies had already developed their systems and, moreover, the market had overcome the problem of lack of standards by establishment of so called Value-Added Networks (VAN[2]).

[2] VAN is a company which provides the service of "translating" electronic messages from the standard of one company (sender) to the standard of another company (receiver) and vice versa.

- Developments in technology and, particularly, the Internet lead to a change in approach to electronic data interchange. With its dedicated technology and networks, EDI fails to provide cost-effective advantages to the small and medium size organisations. The cases of successful implementation of EDI "... have been in markets where a dominant player has been able to dictate terms and require other organisations to install and use EDI as a condition of doing business with them" (Lloyd's List, March 22, 1994). This was affordable only to large organisations such as MAERSK, American President Lines and other majors.

Having that in mind, today there is still no clear picture of how EDI will develop, but the importance of Internet to this development is beyond any doubts. In addition, EDI in broader terms means communication and today it is very difficult to draw a line between software and communications applications, when the software is "moving onto the web" (Fairplay, 1999, page xi).

3.2.3. Internet

Very recently, only five years ago, there was no such term as Internet. Now, it is estimated that there are 148 million Internet users, with double-digit growth rates. The business transactions via Internet and private commercial networks were estimated at US$ 8 to 9 billion in 1997. Moreover, it is forecasted that this figure will grow to as much as US$ 400 billion by 2002, which will be achieved by the expansion of commercial activities made online driven "…by marketing and cost reduction benefits that many businesses are realising through this new media" (UNCTAD, 1998, page 2). UNCTAD (1997, page 3) suggests that the Internet expansion will have far-reaching consequences on the way individuals and companies access and provide information, in particular for the purpose of business transactions.

The use of Internet in the shipping industry has started with the first Internet site, published by Orient Overseas Container Line (OOCL). By launching the site OOCL "…provided the first interactive Internet features within the industry" (OOCL, 1998).

Today, OOCL and other industry leaders use Internet to provide customers with a number of interactive value-added services. As an example, APL's system gives customers the possibility to exchange information with the carrier and other parties involved in the transportation chain. The type of information and possible means of its exchange are shown in the following table:

	Rate Request	Booking & Shipment Instructions	Bills of Lading	Vessel & Stacktrain Schedules	Vessel Arrival Notices	Electronic Tracing	Payment
EDI		•	•		•	•	•
Internet	•	•	•	•		•	
PC Software		•	•		•	•	
Fax						•	

Table 3.1. Transaction overview of APL's information exchange.

Source: APL, 1999 www.apl.com/content/trace/edi.html.

Effectively, Internet has two functions: delivery of electronic mail and "browser" interface, which allows easy and simple access to information on different computers scattered around the world.

The first function, e-mail, is not a development that was brought by Internet. Electronic mail was used as the means of exchange of messages and data through EDI systems over private networks or regular telephone lines since their invention. Nevertheless, the distinction of Internet e-mail is its extremely low cost. It is "… the area of IT investment that has given users the biggest cost savings" (LSE, April, 1997, page 8). The trend of increasing numbers of messages sent by e-mail, rather than by fax or telex, should continue, although some associated problems, such as security and reliability should be overcome. The security and reliability are considered as the main reasons that prevent the use of e-mail as the mean for exchanging business information or the tool for ship-fixing negotiations.

Another area of Internet application is its “browser” interface. The advantage brought by this interface is the simple, standardised and low cost access for any organisation or individual to a computing power of the systems beneath it (Lee, 1997, page 10). There is a broad range of applications of this ‘power’ that are in use today and even more that may be developed in the future. The mentioned applications of Internet by the biggest container lines show a good example of that. In addition, the applications are becoming increasingly user-friendly and easy to use. For example, by using the most recent IT developments APL have developed a container management Web site (see figure 3.2.), which “… allows the customers to tailor the content and layout of their page to satisfy their specific business objectives, as well as their own personal preferences” (APL, 1999).

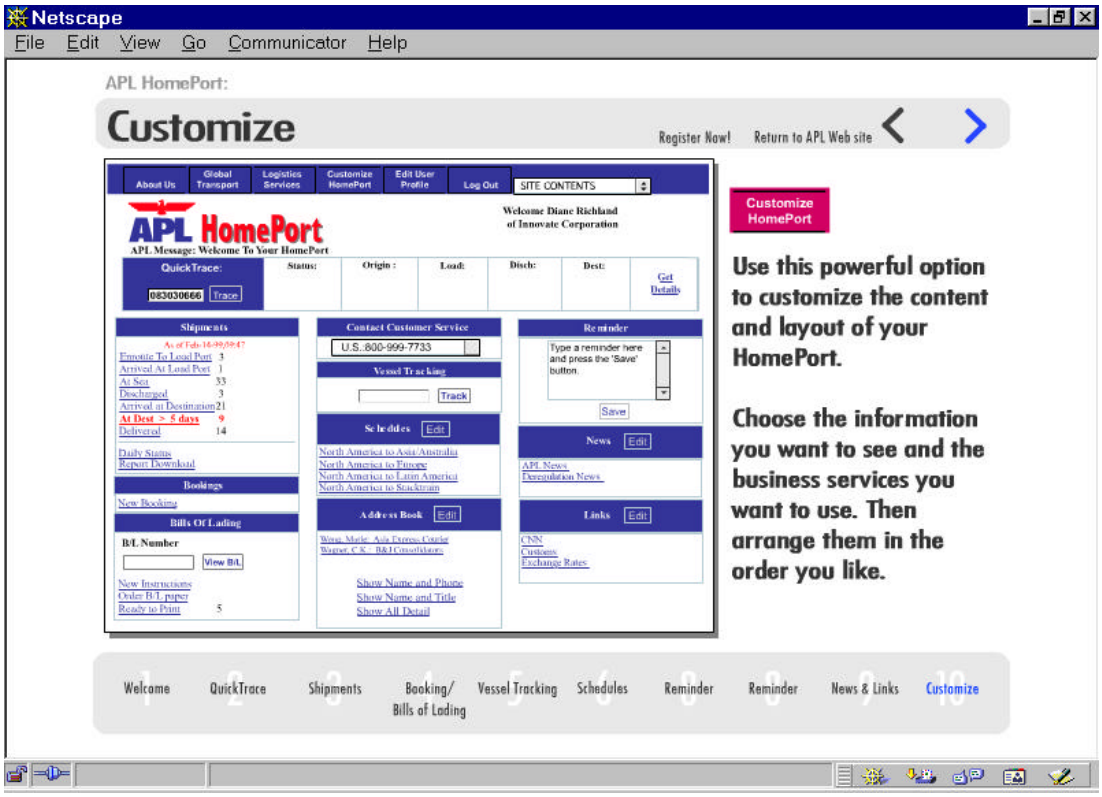

Figure 3.2. Screen shot of the APL’s customisable web service “HomePort”.
Source: APL, 1999. ‘Web Product Demos’. From:
http://www.apl.com/content/help/hpdemo.swf

The Internet brought the possibility to provide small and medium sized companies (and even individuals for that matter) with the means of EDI, which have been

considered un-economical in previous years. As was mentioned above, Internet provides the means for EDI at low cost and recent developments show how the industry reacts and tries to utilise available technology for even better information management. Nevertheless, apart from the benefits brought by Internet, it also has given rise to new problems, which should be considered in order to gain full advantages of it. The main concerns about the use of Internet are given by ESCAP (1999) as:

- there is no governing body or agency;
- there are no service quality guarantees;
- there is no security of transaction;
- information on the Internet is unstructured, unsorted and difficult to find;
- operations are often unstable; and
- there are no proper payment schemes.

As will be seen from the following chapter, some of the above issues are being addressed and steps are taken to deal with them.

Chapter 4

RECENT DEVELOPMENTS OF IT AND IM

4.1. Legal developments

One of the biggest problems, which has to be overcome in order to promote and utilise the available and future technology, is coming from the legislation. Legislation may set rules that are incompatible with the use of electronic means in business transactions as well as there may be lack of legislation in some areas which need it for proper functioning.

First of the legal obstacles to the development of electronic commerce is the requirement for a "written", "paper" document, hand written "signature" or "original" document (Faghfouri, 1997, page 1). From the legal point of view, such requirement, incorporated in national legislation or International treaties, makes EDI messages unacceptable means of communication. There are several issues "…regarded as creating obstacles or uncertainties in relation to the use of electronic means of communication in international trade (…):

- Requirement for a "written document"
- Requirement for the "signature"
- Requirement for the "original"
- Evidential value of data message
- Storage of data message
- Documents of title/negotiability
- Allocation of liability
- Validity and formation of contracts

- Incorporation of general terms and conditions" (UNCTAD, 1998a, page 32).

An in-depth analysis of those are beyond the scope of this work, but there is a need to mention that industry and a number of national and international institutions are looking for ways to overcome these problems. The investigations carried out by the United Nations Commission on International Trade Law (UNCITRAL) have showed that the only solution to overcome problems and uncertainties of the use of EDI is by adopting special legislation dealing with these matters. To support this, UNCITRAL prepared and adopted a "Model Law on Electronic Commerce" which aims "…to assist all States (…) in enhancing their legislation governing the use of alternatives to paper-based methods of communication and storage of information and in formulating such legislation where none currently exists" (UNCITRAL, 1997, page 2).

However, the known fact that legislation often takes a very long time to be put in place, led to alternative developments, which would allow the use of EDI under existing legal regimes. The general basis of such development is the use of contractual agreements between two or more parties in the trade. Such agreements specify the role and responsibility of each contracting party for transmitting, receiving and storing electronic messages in business transactions (Faghfouri, 1997, page 2). The approach works quite well and today there are a number of model agreements prepared by different organisations including such organisations as the United Nations Economic Commission for Europe and the Commission of the European Community. However, despite the abilities of such agreements to minimise the risk and uncertainties in using EDI, Faghfouri (1997, page 4) notes that such agreements can not operate against legal obligations arising from mandatory law.

4.2. Technological developments

The lack of legal environment has by no means restricted the developments of technology. Today, technology is developing at a rapid rate and new solutions are being found to make the use of existing infrastructure more efficient or to overcome shortcomings, which hinder further developments. The most common issues today are the security of information sent by electronic means and the speed and availability of the networks.

4.2.1. Security

Lack of security is considered as the biggest hindrance to the use of electronic means of communication. The threats to messages sent over a public network, such as Internet, are:

- a message may be duplicated, lost or replayed;
- a message may be intercepted and modified;
- a third party may pretend to be a valid message sender;
- the sender may claim he never sent a particular message (repudiation of message responsibility by its sender);
- the recipient may claim he never received a particular message (repudiation of message responsibility by its receiver); and
- a message may be read by a third party (unauthorised disclosure of message content) (ESCAP, 1999, Annex V)

Today, the technology provides different solutions for these problems (see table 4.1). Basically, those solutions can be divided into two categories: (a) solutions, which take care of the security on the in-house level, thus protecting a company's data from access by unauthorised persons; and (b) solutions to protect data and ensure trust in electronic dissemination of information.

The first category uses so-called "point tools" (ESCAP, 1999), which include control on the access, confidentiality, integrity, as well as audit and monitoring. This can be

done by different means, depending on the level of security needed. For example, simple use of login names and passwords can ensure that an unauthorised person will not be able to access data stored on a personal computer. In addition, the technique, called “firewall”, may protect corporate network access from the Internet.

Security concerns	User authentication	Acknowledgements	Audit trails	Encryption	Digital signature	Message authentication code	Modification detection code	Message sequence number
Access control	●							
Origin authentication	●				● or	●		
Content integrity	●	●		●	● or	●	●	
Sequence integrity		●						●
Non-repudiation of origin	●		●		●			
Non-repudiation of receipt		●	●					
Confidentiality	●			●				
	Countermeasures							

Table 4.1. Electronic commerce related security countermeasures.

Source: Economic Commission for Europe, "EDIFACT security implementation guidelines", (TRADE/WP.4/R.1026/Add.2), In: ESCAP, 1999.

The second category, aims to ensure trust in the use of electronic means as the tools for communication and media for doing business. ESCAP (1999) states, that “…concern for the policy maker is the availability of trust management products and services that will provide the foundation for trust for the wide use of Internet”. The general idea is to use techniques and services, which ensure security and provide confidence in it. In order to achieve that, different cryptography techniques are used. The two most common and widely promoted are the use of encryption and digital signatures. In addition, the necessity to link digital signatures with a particular person or entity and to provide trust services, in order to make the counter-part accepting a document signed by digital signature sure about the originator of the message, leads to the establishment of trusted third parties or certification authorities. Furthermore, certification authorities or trusted third parties have a crucial impact in ensuring acceptability and legal recognition of digital signatures (ESCAP, 1999).

Finally, it is necessary to say, that ensuring security costs money, time and effort, and all these increase with the level of security. Therefore, there is a need for a critical approach in selection of particularly sensitive data, to which these techniques should be applied. “Different levels of security have to be selected between different trading partners according to the vulnerability of their business processes” (ESCAP, 1999). This was supported by one of the managers of the company called MARLINK, who said, that most of the time when their customers learn about the costs of security, they say that “…security is not worth to pay for – ID and password are enough”. Again, this depends on how dependent the business is on information and the sensitivity of the information.

4.2.2. Speed and availability of the networks

The speed and availability of the networks is another important issue for the developments in the information technology. The basic trend for the closely interconnected ship-shore information systems and the expansion at enormous rates of electronic commerce put the needs for bigger bandwidth of the networks and for global coverage.

Presently there are a number of technologies giving a broad range of possibilities when choosing the right speed and configuration of the networks, which best suits the requirements of a particular company or particular task. Nevertheless, the more advanced applications and ever increasing flow of data means an increasing need for high speed and broad band networks. Such networks are in use by many companies with the capacity to handle data at speeds up to 100Mb/s. However, such speeds can only be achieved, in cost efficient way, within distances of several hundred metres. That is sufficient for in-house company’s Intranets, but far from being sufficient for the world-wide coverage needs.

The companies developing new or upgrading existing systems to provide global mobile communication links via satellites aim to address two main problems of today’s networks: speed and availability. The latest is of particular importance to the

shipping industry, because such projects as BOLERO (see below) may fail to achieve their objectives if users can not be reached globally. One of the Greek ship managers stressed this by stating his belief that electronic Bills of Lading (B/L) will not come true very soon because of the lack of electronic links to developing countries, where main volumes of cargoes originate. ESCAP (1999) also stresses the need for quick moves toward integration of developing countries in global communication networks.

In addition to the global reach, there is also increasing need of higher speeds for advanced applications of Internet access, videoconferencing, high quality voice and digital data at low "Internet-based" costs.

To address such issues, several huge international projects are now under development to provide high-speed data communications world-wide. The following table summarises present and future satellite systems and their services:

Name	IRRIDIUM	INMARSAT M	GLOBALSTAR	TELEDESIC	ODYSSEY	ICO
Owner	Motorola	Comsat etc.	Loaral, Qualcomm	Bill Gates, Craig McCaw	TRW	INMARSAT, Hughes
Satellites	66, 11/orbit	6-20	48 (8 spares)	840	12	10, 2 spares
Orbits	900km, 6 polar orbits	36000 km	1400 km, inclined	700 km	10370 km	8-10000km
Type	Big LEO	GEO	Big LEO	small LEO	MEO	MEO
Round trip delay	10 ms approx.	500 ms	10 ms approx.	8 ms approx.	120 ms approx.	200 ms approx.
Start of Service	1998	1993	1997	2002	1999	2000
Services	Voice, Data (2.4 Kbps), FAX, GPS	Voice, Data (2.4 Kbps), FAX, Telex	Voice, Data (9.6 Kbps), FAX Location services	Voice, Data upto 2Mbps	Voice, Data (9.6Kbps), FAX, GPS	Voice, Data (2.4Kbps), FAX, GPS
Remarks	Supports Intersatellite links and handoffs during calls	Allows a 6.4Kbps voice channel, suitcase terminal	No Satellite handovers, elliptical spot beams	Phased array antennas, installation costs - US $9,000	No handover, steering antenna eliminates spot beam handover	4500 telephone channels per satellite

Table 4.2. Satellite communication providers.
Source: Compiled from different sources on Internet (1999).

Apart from the companies mentioned in the table, there are a number of smaller players, which try to utilise Low Earth Orbiting satellites (LEOs) for data-only

communication world wide. Such systems, provided by Orbcomm, Leo One, Echostar and VITA, will give ship operators cheap ways to monitor their vessels from land (Fairplay, June 4, 1998, pages 36-37).

The number of companies involved and financial status of some of the players gives strong ground to believe that the problems with network speeds and coverage will be eliminated giving boost to the electronic commerce. In addition, the competition between satellite and among satellite and land-based network providers should ensure low prices that are the strength of Internet today.

4.3. Other developments

The issues of legitimisation and security of information management by electronic means as well as other developments of information and communication technology are being analysed and monitored through a number of international projects. The projects, which are mostly initiated by different international bodies or strong industry communities, aim to promote use of IT in the shipping industry and thus improve the efficiency of the performance of the industry.

The two major projects, which will affect the maritime industry in total and in Europe in particular, are briefly described hereafter.

- **MARIS**

Maritime Information Society (MARIS) is one of the 11 pilot projects initiated by the European Union (EU) during a G-7 ministerial conference in 1995. The aim of the project is to establish a maritime information society by demonstrating "…the potential benefits of IT and telematic applications for a broad range of maritime activities building up on existing systems by promoting interoperability, and developing international co-operation to create new services on a global basis" (MARIS, 1999).

The MARIS has four sub-projects, aiming to seek MARIS objectives in fisheries (MARSOURCE), transport (MARTRANS), safety (MARSAFE) and shipbuilding (MARVEL).

The most important for a commercial operation of short-sea shipping lines is the project MARTRANS. Initially MARTRANS had the aim to create a logistic information network through interconnection of EDI Port information community systems as well as to create such systems in the ports of EU, which were lacking them (Blonk, 1998). Today, the aims have shifted and project approaches are being directed toward:

- Interconnected and interoperable information and communication network linking all actors of the intermodal transport chain;
- Establishment of world-wide information networks, thus moving beyond the boundaries of EU;
- Promotion of open communication platforms for supply chain management (e.g. Internet).

The scope and range of the activities of MARTRANS may be seen from the number of MARTRANS related research projects that presently amount to 17 (see Annex I).

- **BOLERO**

The BOLERO project was initiated in 1995 as a research project funded by EU. In 1998 BOLERO has become a joint venture of the Through Transport Club (mutual insurer of transport and freight forwarding industries) and S.W.I.F.T. (electronic co-operative with 3000 member banks). The aim of the project is to develop a “neutral system that will allow the secure electronic relay of information, including negotiable bills of lading, among various elements of the transportation chain” (American shipper, August, 1998). The basic principles of the BOLERO system are being based on:

- **Cross-industry, global neutrality**, pooling recourses from both the banking and transport industries;

- **Legal infrastructure based on the Rule Book**, which is "a unique, binding, multilateral floating agreement between all the parties involved in the project" (American Shipper, August, 1998).
- **Trusted third party**. The system will be run by the company, which enjoys wide support and ownership from thousands of industry parties through S.W.I.F.T. and TT Club members. Through this the company gains essential support, which is necessary for this paperless system to work efficiently.
- **Open commercial model**. The system provides the users with freeware that enables the link to the BOLERO system and ensures and regulates security and the formatting of transmissions. Further utilisation of this system and the level of integrity depend of the needs of a particular user, which may seek dedicated EDI interconnection with BOLERO, or may just use an Internet browser to enter required information for a transaction.

The BOLERO project is reaching the final stage and is due for commercial launch in the autumn of 1999 (BOLERO, 1999). It is of necessity for all industry to follow the developments (if not participate in it) since, providing the success of the project, it may change the way business is done throughout the industry.

Apart from the MARIS and BOLERO projects, there are a number of other projects run on a regional, national or commercial basis. The aims of such projects are to find ways to utilise emerging technologies or overcome existing problems. For example, the PROSIT project, which stands for "Promotion of Short-Sea Shipping and Inland Waterway Transport by use of modern telematics", has a number of goals from reduction of road transport to a general implementation and testing of new communication technologies in the transport industry. Therefore, it is true to say that every shipping company should take a close look at the developments and outcomes of such projects in order to find better information and communication management solutions for its particular business.

Chapter 5

LITHUANIAN SHIPPING COMPANY (LISCO) AND LISCO CONTAINER LINE

5.1. Lithuanian Shipping Company (LISCO)

5.1.1. Overview

Lithuanian Shipping Company was established in 1969. However, it was only in 1991 when LISCO became a real owner and operator of its fleet. Until then, the company had operated under the authority and commercial control of the Ministry of Merchant Marine of the Soviet Union. The system of planned economy for the company meant a limitation of freedom in decision making since all commercial decisions were made and passed down from the Ministry in Moscow.

The attainment of independence by Lithuania has meant huge changes and challenges for the company. Overnight, the company found itself in the free, competitive international shipping market. At the time, LISCO had 35 ships, some of which were 24 years old. There was a clear need for fleet renewal in order to survive in the free market. In addition, there was a need for a change in management style as well as learning new ways of doing business, such as chartering in the open spot and time charter markets.

From today's perspective, it may be seen that the company has overcome the first difficulties and gained a relatively strong position in some of the markets. The fleet renewal program started by acquisition of two container carriers "Mindaugas" and "Algirdas" in 1991-1992 and since then totally 13 ships were built or acquired and another 13 where sold off. In addition, several ships have passed through considerable renovation processes, such as conversion of the Ro-Ro/Rail carriers "Kaunas" and "Vilnius" for the carriage of road trailers as well as passengers.

The financial status of LISCO is quite good. During the period of 1995-1997 the company was producing an average return on equity (ROE) of 9%. However the market slump, which have started in 1997, had its effects on LISCO's 1998 results. According to the report of the financial brokers of the Lithuanian Savings Bank (LTB, 1999), the turnover for 1998 stood at $63.99 million (14% less than in 1997) and the company earned only $0.45 million of profit after taxes (in 1997 – $11.07 mill.). Consequently the rate of return on equity has fallen to 0.3 percent. The basic causes were declared to be the Russian crisis and subsequent fall in cargo flow to Russia. For example, the main ferry lines of LISCO from Lithuania to Germany had a reduction in cargo traffic by 60%. Furthermore, a general world shipping market recession led to poor freight rates and consequent financial results for other ships of the LISCO.

The following table presents the financial data of LISCO for the period of 1995-1997 and was compiled by Vilfima Securities – a financial brokerage company in Lithuania.

		1995	1996	1997
Face value	LTL	10.00	10.00	10.00
Book value	LTL	16.15	13.62	14.09
Div. per share	LTL	0.10	0.35	0.12
Div. yield	LTL	6.25	21.88	7.50
Current assets	LTL 000	140.314	86.315	93.495
Total assets	LTL 000	636.360	676.693	716.839
Owners equity	LTL 000	616.430	641.910	667.992
Authorised capital	LTL 000	381.641	471.343	516.672
Total liabilities	LTL 000	19.930	34.783	48.847
Current liabilities	LTL 000	4.890	5.730	39.127
Sales	LTL 000	295.432	323.463	319.022
Net profit	LTL 000	67.668	45.075	57.591

Table 5.1. LISCO financial figures for the period of 1995-1997.
Source: Vilfima Securities, 1999.
http://www.vilfima.lt/vp.en.asp?VpKodas=11627&Report=1

5.1.2. Fleet structure

Today, LISCO has 35 ships of mainly three types: bulk carriers, general cargo/container carriers and Ro-Ro/passenger vessels.

Bulk carriers

The fleet of bulk carriers of Lithuanian Shipping Company consists of 11 sister ships of the “Kapitan Panfilov” type with a total carrying capacity of 151162 tonnes. Today, they are rather old ships in the fleet, built between 1975 and 1981. The ships are capable of carrying 13742 tonnes of cargo with an average speed of 12 knots. The main trades of the ships are between continental Europe, the Mediterranean and North America. During the last years, all ships have been certified as ISM Code compliant and the ability to trade in the strict regimes of North American ports shows the good status of maintenance of the vessels.

General cargo/Container carriers

The company owns and operates 18 general cargo and container ships of five types. The biggest and oldest group of ships are the “Igor Grabar” type vessels built in 1973 and 1974. Each ship has a carrying capacity of 3580 tonnes and is capable of sailing at a speed of 12.4 knots.

Another group is two river/sea ships of the “Volga” type. They were acquired during the first phase of the fleet renovation program in 1991-1993.

A third group has two sister ships. They are the Turkish built “Mindaugas” and “Algirdas” with the carrying capacity of 3400 tonnes or 224 twenty-foot equivalent units (TEU) containers. Two other ships were built in 1995 and 1996 by the Lithuanian shipyard “Baltija” and named “Vytautas” and “Gediminas”. Those ships have a capacity of 4100 tonnes or 254 TEU’s and a speed of 12.5 knots.

Finally, there is a series of six newbuildings, delivered in 1996 – 1999 that are general purpose/container ships. The ships were built partly by “Baltija” shipyard

(Lithuania) and partly by the Astilleros De Huelva shipyard (Spain). All of them have a capacity of 353 TEU's and deadweight of 5606 tonnes. The ships are designed to sail at a speed of 13.7 knots.

Ro-Ro/passenger ferries.

All Ro-Ro and passenger ferries of Lithuanian Shipping Company operate in the Baltic Sea on the routes from Klaipeda (Lithuania) to Kiel, Mukran (Germany), Stockholm and Åhus (Sweden). The fleet consists of six vessels. Two of them, "Vilnius" and "Kaunas" are capable to carry passengers, rail wagons and trailers and operate between the ports of Klaipeda and Kiel. The ferry "Klaipeda" can load up to 103 rail wagons and operates on the route from Klaipeda to Mukran.

Sweden is served by two ferry lines from Klaipeda to the ports of Åhus and Stockholm. The Åhus line has daily sailings and is operated by two Ro-Ro vessels of the "Kompozitor Kara-Karaev" type, the "Panevezys" and "Siauliai". The ferry "Palanga" calls Stockholm three times per week and carries 78 forty-foot trailers as well as 133 passengers.

5.1.3. Management structure

LISCO is a stock company with 79.9% of the shares owned by the Government and the remaining 19.1% by private investors. Today it is difficult to describe the status of the company, since the Government's part of the shares are due for privatisation, which means coming changes in the management.

However, until now the internal management of the company is done by the president and board of directors, consisting of six directors (Liner ships, Tramp ships, Technical, Personnel, Economy, Finances). LISCO has about 1700 employees, 1200 of which is seagoing staff. The organisational structure of the company is presented in Annex II.

5.2. LISCO Conline

5.2.1. Overview

A container line of Lithuanian Shipping Company has been opened in 1998. It was the latest project, which at the moment is in its first year of implementation and thus it is too early to measure its success or failure.

The container traffic to the Eastern ports of the Baltic Sea, which mainly serves transit cargoes to Russia and other CIS countries, has been growing for a number of years. The total number of containers handled by Baltic ports has trebled to 581,000 TEU's between 1991 and 1997, and forecasts estimate a growth of 345 % till the year 2010, increasing the throughput to 2.58m TEU's (Lloyd's List, 1999). Presently, the biggest container traffic in the region is handled by the ports of Helsinki (Finland) and St.Petersburg (Russia) amounting to 393,500 and 250,000 TEU's respectively (see figure 5.1)

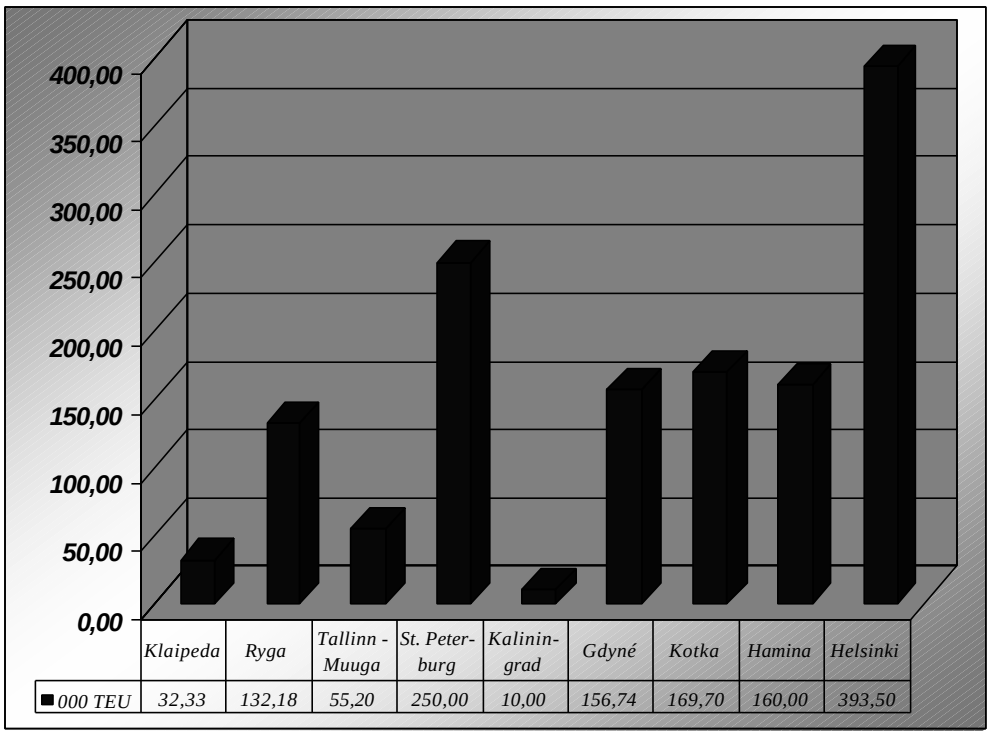

Figure 5.1 Container handling through ports of east coast of the Baltic Sea in 1998.

Source: Klaipeda State Seaport Authority, 1999.

The port of Klaipeda has several competitive advantages compared with other ports on the eastern Baltic Sea coast. First, it is the northernmost port in the east Baltic Sea, which is open all year round, i.e. is not covered by ice during the winter season. In addition, the newly opened container terminal, the absence of which was the biggest obstacle for the development of container traffic through the port, gives big potential for the attraction of containerised cargo. By operating the container line, which utilises the port of Klaipeda and its container terminal, LISCO employs its own advantages, such as extensive know-how of the local environment and good co-operation with the authorities as well as private companies, serving the line and its cargoes.

The advantages of LISCO container line (LISCO Conline) are defined as follows:

- Utilisation of the modern container fleet of the company;
- Potential to increase capacity of the line in case of increase in the cargo traffic;
- Reduced port dues by registration of the line;
- Possibility to obtain competitive charges for the forwarding, cargo handling and other services;
- Delivery of the cargo from door-to-door (LISCO, 1998).

The first year of operation gave the company, naturally, considerable losses. Apart from the natural lack of cargo volumes for the newly opened line, the loses were even bigger due to the general depression of the world shipping market as well as turmoil in Russia, which is the market aimed to be served by the line. Nevertheless, first half of 1999 has shown signs of recovery and growth of the cargo flow, which gives hope for the success of the line.

5.2.2. The route

LISCO Conline operates between the ports of Klaipeda (Lithuania), Antwerp (Belgium) and Bremen/Bremerhaven (Germany) (see figure 5.2).

Figure 5.2. Route of the LISCO Conline

5.2.3. Employed and potential fleet

Presently there is one ship employed on the line. It is the multipurpose/container carrier “Gediminas”, which can carry up to 254 TEU containers or 4100 tonnes of general cargo (for further details see Annex III). The ship is providing a regular 10 days service to each port.

Aiming at an increase of cargo throughput, LISCO has a potential to add further tonnage to the line at any moment. The potential fleet may consist of a further nine vessels with the total carrying capacity of 3074 TEU’s and the ability to provide a daily service from any of the ports.

5.2.4. Management

Overall supervision and technical management of the line is handled by the Container line department of the LISCO with the help and co-operation of all other departments of the company. The commercial side is done by the general agent of the LISCO Conline - “Jurkontas”, located in Klaipeda. As the General Agent of the line, “Jurkontas” is involved in:

- “Booking of any types of cargo for LISCO Conline and for further delivery world-wide;
- full stevedoring service in the port of Klaipeda;
- inland delivery of cargoes to various destinations in the Baltic States, Russia and other Republics of the former Soviet Union;
- container tracking.” (Jurkontas, 1999).

Other ports are served by local agents in the ports of Bremen and Antwerp.

Chapter 6

INFORMATION MANAGEMENT FOR CONTAINER LINE BETWEEN PORTS OF LITHUANIA, BELGIUM AND GERMANY

As in any shipping line or shipping company, LISCO Conline has a great amount of information flowing between involved parties inside and outside the organisation. The information management hub for the line is the General Agent “Jurkontas”. They are the ones who are dealing with customers, authorities and customs; issue booking notes, take care of the container and consignment tracking and pass information to LISCO and other agents. This is why proper information management is so important for “Jurkontas”. In other ports, the local line agents are busy as well, having to find the cargo, book it, arrange for the handling at terminals and provide other services to the line and its clients.

The advancements in the information management and communication technology, consequent rise in demands of the customers and weak market conditions put pressures on the shipping line to be as efficient as possible. In order to perform in the most efficient and cost-effective way, all parts of the transportation chain of the line should co-operate and utilise existing and available technology. However, from the point of view of information management, the availability of technology, or information infrastructure, is very different in different ports of the line. As the port’s infrastructure is one of the key factors in ensuring smooth cargo flow, there is a need to look at the way information is handled and managed in different ports.

6.1. Information infrastructure

Ports are hubs and, sometimes, bottlenecks of the cargo flow. The cargo passing through the port, generates huge amounts of information, which is necessary for a number of parties involved in this process. The parties include the customs, ship

agent, cargo forwarders, trucking companies, port authority, ship owner, terminal operator, banks, insurers, etc. All of them need information. And the power of some of the entities to stop cargo on the basis of lack of or deficiencies in information, makes the need for proper information management and communication evident.

As was mentioned before, the best way to ensure timely, accurate and sufficient information at the place where it is needed, is to use electronic data transmission. The problem arises when different parties in the transportation chain, or in port, have different levels of information infrastructure or the used and available IT systems are not interconnected between each other.

6.1.1. Port of Klaipeda

The Port of Klaipeda, at the moment, has the least developed information infrastructure when comparing with the ports of Belgium and Germany. The main problem is the lack of inter-connectivity between IT systems used by different port users. For example, custom's offices use an EDP system, which on demand is connected to the main database of the country, but it lacks the interface for the submission of cargo and ships' documents to the system electronically. This leads to the requirement for paper documentation (although together with the electronic data of the cargo declaration, which is required to be presented to customs on diskette), which consequently leads to all the problems associated with the use of paper documentation.

Another party, which requires documentation but does not provide the means to submit it electronically, is Klaipeda State Seaport Authority (KSSA). The Authority takes care of the safety and infrastructure of the port as well as collecting port dues from the ships.

Apart from customs and KSSA there are other authorities and companies, where improvement in information management by implementation of IT solutions would facilitate cargo flow through the port and reduce overall costs.

As a positive trend, it is necessary to note that steps are being taken to take care of the problems and to develop a “Port Information System”. The actions have started in 1996, when KSSA with the help of international consultants, financed by the PHARE programme, made an assessment of the existing port information infrastructure and prepared tender documents for the development of the system. Furthermore, two main data input forms where developed: the General Declaration for the information about cargo and port services and Ship Declaration to provide information about the ship. Basically, according the consultants, the port information system should consist of a modern information centre that would keep all main information, and five software packages for the port service order, shipping information, rail information, dangerous cargoes information and customs declarations.

The implementation of the project for the development of the system had some difficulties and hindrances, which led to the extension of the date of final implementation. According to the last port investment plan, the implementation of the port information system should start in the year 2000 and the system should be in place by the year 2002 (Talat-Kelpsaite, 1999).

In addition, other private companies are upgrading their own information systems for better efficiency and competitiveness. An example could be container and ferry terminals of the Klaipeda Stevedoring Company (KLASCO), where an information system, based on BLG terminals’ information system in the port of Bremerhaven, will be implemented. This is of particular importance to LISCO Conline, since in the port of Klaipeda the line is serviced in the KLASCO Container terminal.

6.1.2. Port of Antwerp

The information system provider for the port of Antwerp is a company called SEAGHA. The company was established in 1986 starting from an EDI network for the companies in the port of Antwerp. Today, SEAGHA “…has become the Belgian Transport Electronic Commerce System and delivers as such: EDI, UN/Edifact, E-

mail and Internet products and services". Presently, the company has 390 clients connected to the network and the number of messages being exchanged through the SEAGHA network is growing year by year (see figure 6.2) (SEAGHA, 1999).

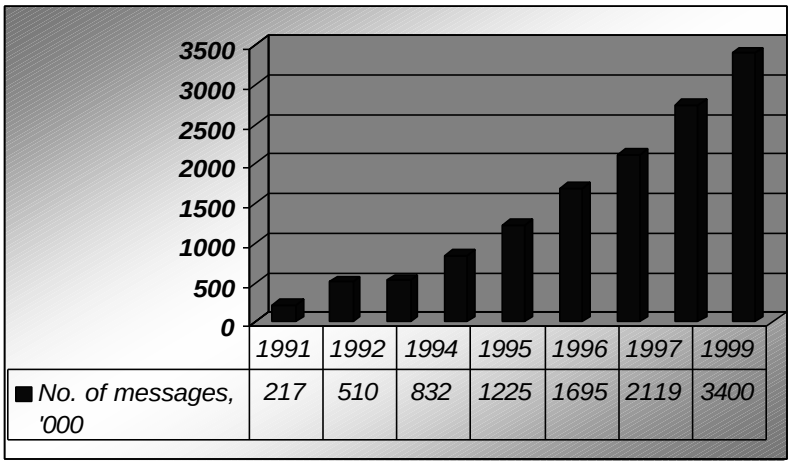

Figure 6.1. The growth in volume of messages exchanged via SEAGHA system in 1991-1999.

Source: SEAGHA, 1999

As in the case of the ports of Bremen/Bremerhaven, SEAGHA provides port users with efficient node-connections. The idea behind is to avoid some basic charges and investments by replacing numerous, complicated point-to-point connections. By a "single point connection to SEAGHA" (see figure 6.3) port users gain access not only to each other, but also to Internet and other cargo community systems (DBH Bremen, DEBIS Rotterdam, MCP Felixstowe, etc.) and international networks (BIMCOM, AT&T, Sprint, etc.). "One connection to SEAGHA-Clearing makes world-wide EDI and e-mail exchange possible" (SEAGHA, 1999).

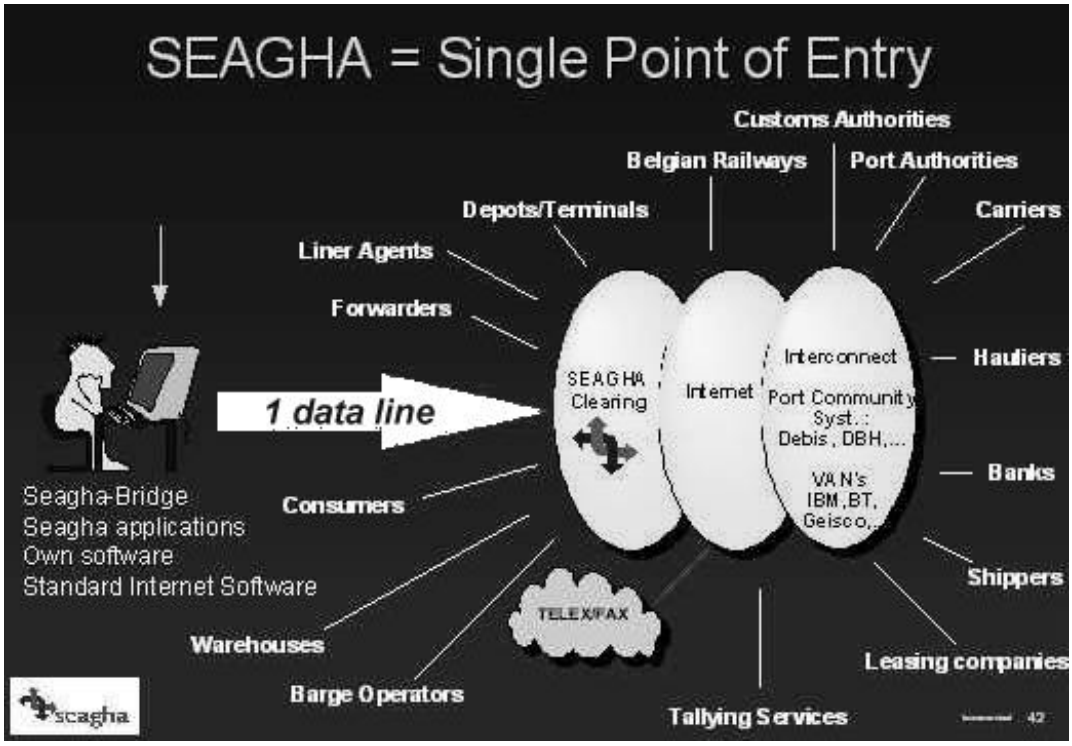

Figure. 6.2. SEAGHA – Single point entry.

Source: SEAGHA, 1999.

6.1.3. Port of Bremen/Bremerhaven

The Ports of Bremen & Bremerhaven were among the first ports in the world that have realised the need and advantages given by EDI for the port community. By initiative of 108 private companies, mostly freight forwarders and port operators, the company “Teleport Bremen” was established in 1978 and today it has grown to be a very efficient and valuable company, providing services to all port users (Grunwald, 1999). The interlinks between the parties may be seen in the following figure (see fig. 6.1).

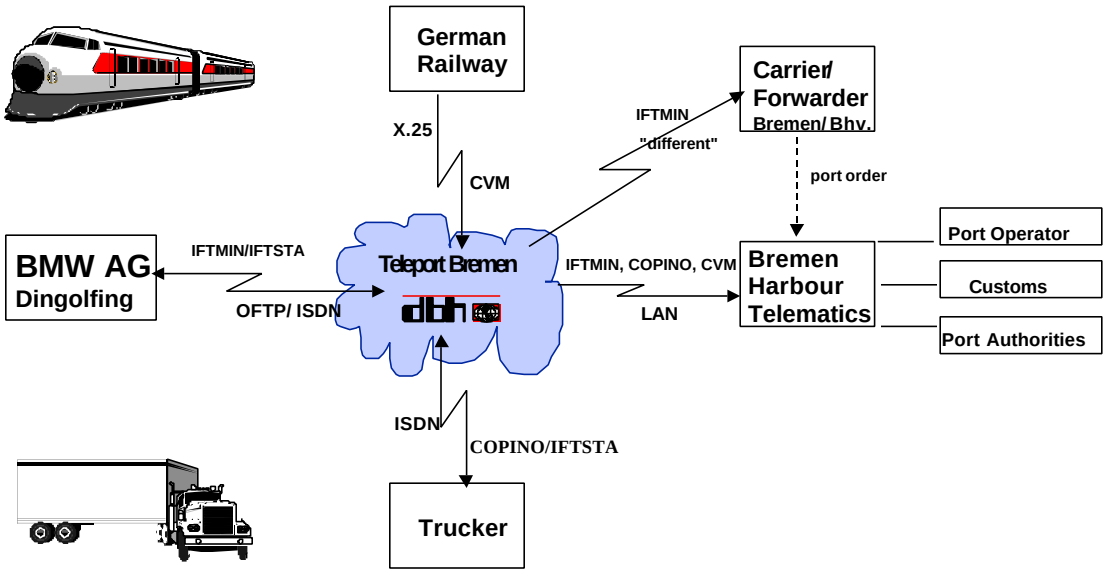

Figure 6.3. Communication interrelations between different users of port information system in the ports of Bremen and Bremerhaven.

Source: Grunwald, 1997.

The port information system in Bremen/Bremerhaven, called “teleport Bremen”, stands for simple, open telecommunications on the principles of:

- total interconnectivity of all participants;
- accessibility of national and international participants;
- exchange of data and messages;
- provision of technical and organisational support;
- possibility of open as well as secure transmissions;
- utilisation of existing systems of the clients. (dbh, 1999).

The main duties of the teleport Bremen is to act as the hub for information exchange and develop the system. The users are connected to the system in mainly three different ways. The first group of 77 companies have integrated their systems into the port system by EDI-client interfaces. Those are the companies, which have closest integration with the system and, thus, benefit most. Another group of 161 companies is using Dialogue based interaction with the system’s main database. They are connecting to the system by dial or leased telephone lines, or through

ISDN/Internet, and have to input data directly into the system's database. The third group is the clients of the service centre. Those are the clients who do not have (or do not want) direct access to the system and uses services of the centre, which inputs the data from paper documents into the system for further transmission to customs, authorities and other parties.

6.2. Information flow and its management in LISCO Conline

As was emphasised several times above, transport is one of those industries with an exceptional flow of information, which today is mostly based on paper documents. The logistics chains from the producer to consumer involve many parties, which usually are located in different places and have different needs and habits. The following scheme presents a good overview of the information flow in a shipping line:

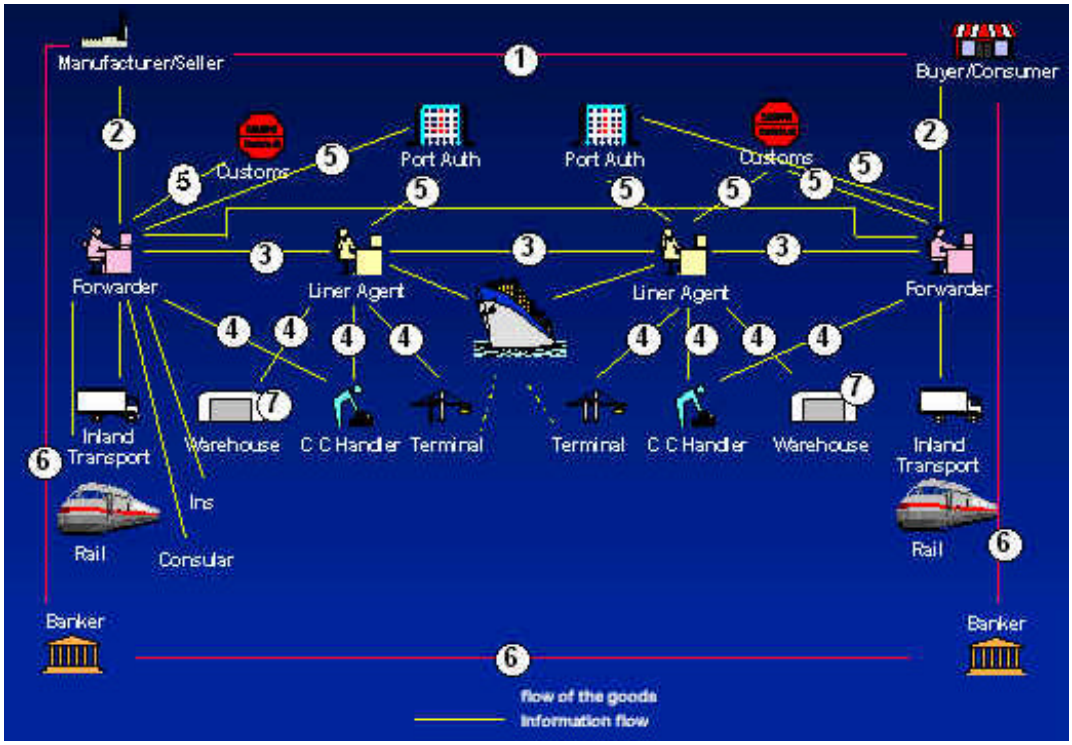

Figure 6.4. Information flow in shipping line.

Source: SEAGHA, 1999.

The scheme indicates the links of the information flow from the manufacturer/seller to the consumer/buyer through the whole transportation chain. It is necessary to note that this picture shows only the interactions between one seller and one buyer, as well as transportation through one port. As in the LISCO Conline case, as well as in any real container line, there will be several, or sometimes several hundred shippers involved and the transportation goes through more than one port. All this increases the information flow even further, which actually would be impossible to handle without the use of modern IT technology.

6.2.1. Lithuanian Shipping Company

Information in the Container Line

Lithuanian Shipping Company, being a carrier and the owner of the LISCO Conline and having outsourced commercial activities to the general agent “Jurkontas”, do not so much have to deal with the information relating to cargo, customs or other authorities. The Container line department of LISCO is mainly responsible for:

- organisation and co-ordination of the co-operation between the partners of the line;
- ensuring the effective and flexible system of tariffs for the transportation of cargo by LISCO Conline;
- marketing of the line in order to attract the cargo;
- following and analysing the legal environment affecting the Line’s trades;
- participation in the preparation and conclusion of the contracts, deals and agreements for the agency services;
- preparation, together with the Line’s partners, of the schedule;
- control of the expenditures and income.

By doing that, LISCO has to have access to all data about the performance of the Line, market, applicable laws and regulations.

Information infrastructure of the LISCO

The information infrastructure of LISCO is rather good. The company was among the first in implementing IT to help in day to day activities. The first mainframe based information management system and network inside the organisation was developed and put to service from the establishment of the company in 1969. Since then, a number of upgrades were done to the hardware and software of the system. Recently, in 1996 the company undertook considerable renovation of the system and it was changed to a Server/Client architecture. LISCO has an IT department, which takes care of the IT infrastructure and software base of the company. The company has a local area network (LAN), which connects 93 users with speeds of up to 100Mb/s. All network users have access to the Internet and e-mail.

Information management in LISCO

The company is using its own software applications, which are based on the DOS working environment. Presently the company's IT staff are making initial research of the options available on the market for the upgrading of the information system by a more sophisticated software package, which will be based on the Windows environment. As was stated by Mr. K.Kolgovas (1999) during an interview by the author, the "ShipNet" software package, developed by ShipNet A.S., a Norwegian software company based in Oslo, seemed to meet the company's needs most closely. Therefore, there is further research going on about the possibilities and shortcomings of this package.

Despite the technical capability of the company, it is necessary to say that all the advantages of the use of information technology are mainly coming from the in-house operations. However, the company works for its clients and they should be the ones who also benefit from the use of IT. The main problems and unrealised opportunities of information management are seen by the author as:

- lack of knowledge and awareness of the possibilities and advantages of more extensive use of the technology;

- lack of attention to the IT matters from the top managers;
- lack of integration of the system with the external systems of the partners, customers and suppliers;
- lack of a sufficient degree of the use of advanced IT solutions by some partners, banks and suppliers;
- lack of understanding of the potential and the future developments of Internet.

Generally, all of these add up to the lack of a clear strategy for the company itself and for IT matters in particular.

6.2.2. Agent in the port of Klaipeda

The line's general agent "Jurkontas" has its office in the port of Klaipeda. The company has basic information management and communication equipment (personal computers, fax machines, telephone) as well as connection to Internet by the dial-up line.

The managing director of the company, Mr. I. Shigin, during an interview (1998) emphasised his concern about the information management. The company sees many advantages that can be brought by IT, but it can not fully utilise them because of the lack of IT infrastructure in the port of Klaipeda and subsequent lack of electronic links with the authorities in the port as well as with service suppliers.

Presently, all data is coming to the company mainly through the post courier, fax exchange and by oral telephone conversations. The company has developed a simple database for the container tracking, based on the Microsoft Excel spreadsheets, which fulfils the present "low traffic" needs of the company. The data are entered manually into the database by one of the staff members.

Nevertheless, Mr. I. Shigin noted that the company is looking at the options to acquire a specialised, "off-shelf" Agency/Container line information management

software package and one of the best alternatives they found would be the “SoftShip Line” and “SoftShip Line management” software packages developed by Softship Datenverarbeitung GmbH. The “SoftShip Line” is an application specially designed for liner agencies. The Fairplay computer guide gives the following description of the package:

> “The application starts from acquisition, continues through contracts/quotations, booking and finally covers B/L processing and invoicing. Furthermore, you get all required lists like cargo and freight manifests, special lists and numerous statistics. Interfaces to port communication systems, telex and facsimile are available. The automated data transfer to various accounting systems is enhanced by shipping specific information like voyage number and vessel. “ (Fairplay, 1999).

Despite the potential usefulness of the package the lack of cargo flow, natural for a newly established shipping line, and the relatively expensive software (starting at 14,500 USD) has been the factors that led the “Jurkontas” management to the decision to postpone the purchase.

6.2.3. Agents in the port of Antwerp

The line’s local agent for the port of Antwerp is a company called “De Keyser Thornton n.v”. For information management the “De Keyser Thornton” is using several software packages. The core application for the processing of loading permits and Bills of Lading is dedicated software “ExpAg”, developed by port information system SEAGHA. “ExpAg” runs in a user-friendly Windows environment and has a direct connection to the SEAGHA network for communication of the documents and information to other users of the SEAGHA network or other information systems. By having connection to SEAGHA, “De Keyser Thornton” also has a direct connection to the LISCO Conline’s agents in the port of Bremen, since Antwerp's port information system SEAGHA is directly interconnected with DBH in Bremen. In

addition, the system allows transmitting information to facsimile machines anywhere in the world directly from the computer, thereby reducing the cost of transmission and manual work. This particular feature is presently used for communication with the line's general agent "Jurkontas".

6.2.4. Agents in the port of Bremen

"Wiking Transtainer Systems" is the line's agency for the port of Bremen. The company has fifteen employees and all of them have personal computers, five of which are connected to the local area network (LAN). In addition, the company has an EDI link with the port information system "Datenbank Bremische Hafen" (DBH), which allows the company to gain maximum efficiency from the use of electronic data transmissions. For the in-house data processing and its exchange with DBH, "Wiking Transtainer Systems" is using a specialised shipping software "SoftShip Line" (see section 6.2.2 above).

6.2. Internet and LISCO Conline

In section 3.2.3 the author have described the developments of Internet and how these developments will affect the shipping industry. Therefore, there is a need to look at how LISCO Conline is using Internet in its daily work.

The Lithuanian Shipping Company has had its web site on Internet from 1996. This was quite an advanced move for that time, however to date, the good start has not succeeded to become a real move toward the utilisation of Internet technology. The company's web site on Internet, www.lisco.lt, has a relatively nice design (see figure 6.5). However, the management of the site lacks attention.

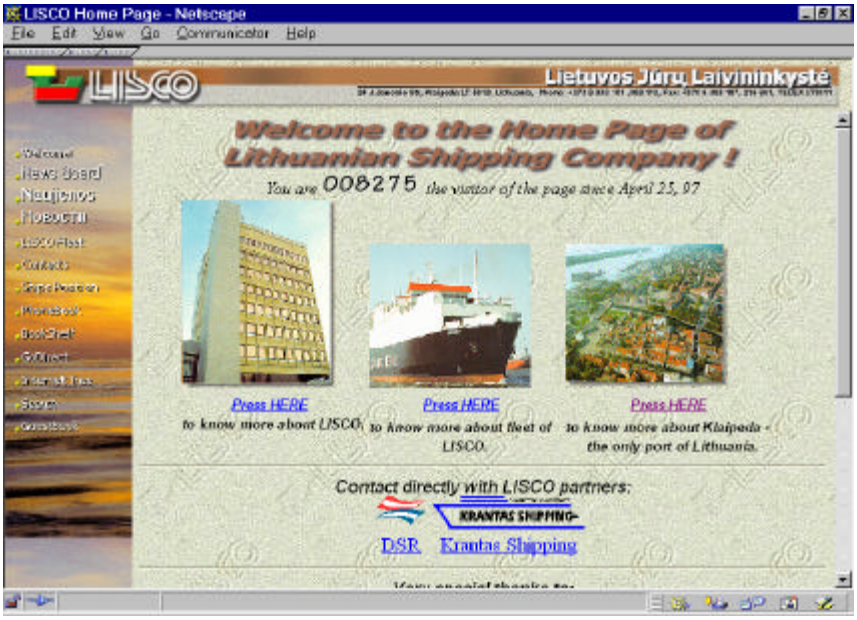

Figure 6.5. Screenshot of the LISCO's web site.

Source: www.lisco.lt

This may be seen from the pages "Under construction", such as Ship's Position, outdated "Phone Book" or broken links. Those pages also indicates the lack of attention toward the clients' needs, since updated ships positions and phone book are the information, which clients are looking for.

A good thing about the web site of the LISCO is that it is easily found with all the major Internet search engines as well as registered in many shipping related directories and lists. The site gives a good overview of the company and its fleet, which is a good tool for marketing purposes and a good start for the use of the Internet.

The LISCO Conline also has a web site on Internet, which is managed by the line's general agent "Jurkontas". However, the site, which can also be easily found through Internet search engines, is an example of what a lines web site should not look like (see figure 6.6).

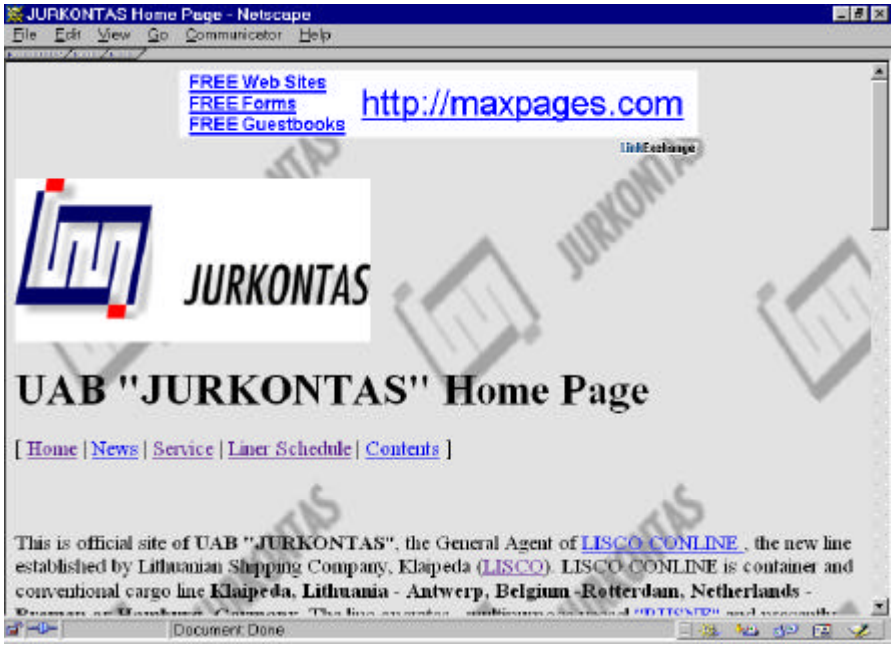

Figure 6.6. Screenshot of the "Jurkontas" Home page.
Source: www.omnitel.net/jurkontas/

The lack of design, outdated and wrong information makes this site a hindrance to the attraction of new customers, instead of a marketing tool.

The line's agents in the ports of Antwerp and Bremen do not have their Internet sites, although they use Internet for e-mail.

The most widely used feature of Internet in LISCO and its container line is an e-mail. LISCO is using e-mail to communicate with its partners, clients and recently, they have moved towards wider use of the e-mail via satellites, instead of the telex, to communicate with its vessels. This is a global move, since all satellite communication providers have reported an increase in the Internet's e-mail traffic and a decrease in the number of messages transmitted by telexes. News coming out in the market is that large transportation buyers, having previously developed strong EDI relationships with their carriers are now abandoning them in favour of receiving data via e-mail as file attachment (John.S, 1999).

Apart from the electronic brochure and the use of e-mail, LISCO is not using other technologies available through Internet. LISCO does not provide any of the interactive services, developed by major carriers, which would permit their clients to get freight quotations, to book the cargo, submit Bill of Lading instructions, to print B/Ls or trace the shipments. This may not be a problem as such, since not many of the small and medium size carriers have very advanced Internet sites or any at all, at this time. However, the speed of the developments in technology and its increasing use by larger carriers and shippers, may require the feeder service providers and niche operators to provide these kinds of services if they want to stay in the business.

All these lead to the need for active development and modernisation of interactive electronic services, which have to be provided to the clients on request. To be able to do that, the top management of the company need to understand what is available and could be done, as well as to have a clear view of the business development strategy.

Chapter 7

CONCLUSIONS

In preparing this paper, the author has looked at the information management in the shipping industry. The analysis was based on identification of the basic needs and sources for information, need for information management, existing information technology as well as the problems and developments in the field. Furthermore, information management in the container line of the Lithuanian Shipping Company was analysed, including an overview of the port information systems of the line's ports of call. This chapter summarises the main points made in the paper.

7.1. Information management in the shipping industry

The shipping industry is evidently information dependent. The commercial activities and regulatory environment of shipping are the two most important sources for the industry's information needs. To meet those needs, there are a number of sources that generate information. The main sources can be broadly divided into the ship, office, market and legislation with all particular activity-related information falling into one or several of these categories.

The amount of information generated in international trade is a very costly item in total transportation and trade costs. It is estimated that processing of documentation may constitute up to 350 billion US dollars per year, amounting to 5-10% of the final costs of the goods delivered to customers. This shows the need for information management to be as efficient as possible.

Today there are a number of new opportunities brought by developments in information technology, which gives technical means to streamline information management. It is very important to understand that IT is only the tool in information

management and that things should not be ”computerised” just because they can be computerised.

The basic advantages and cost savings given by information and communication technologies are:

- Avoidance of data re-entering (reduced administration costs);
- Avoidance of manual errors in re-entering data
- Avoidance of errors in transmission of data
- Improvement of information management
- Facilitation of cargo flows
- Facilitation of cash flows

There are a number of means and solutions to get the most out of the information technology. On the software side, solutions are basically split into two parts, where half of the companies are developing in-house packages and others use specialised software developed by specialised companies. There are a number of advantages and disadvantages in both approaches and each company should find the solution which best fits its needs.

Another consideration is the cost involved in the use of information technology and especially in the use of electronic commerce via electronic data interchange. These were the biggest obstacles for wider use of the EDI solutions by small and medium companies since the invention of technology in the mid-seventies.

Internet is seen as a tool, which will give a boost to electronic commerce worldwide. Many large shipping companies are using Internet to provide customised services to their clients. However, the biggest advantage of Internet is its low cost, which gives the possibility for cost-effective use of EDI in business transaction. By this, EDI becomes accessible even for the smallest organisations and this, consequently should lead to the development of a ”paperless” trading environment, saving above mentioned costs of today’s trading procedures.

Until then, some of the problems of Internet and e-commerce should be overcome. Firstly, legislation should be adopted to the new ”electronic” environment. Secondly, the issues of security, speed and availability of the networks should be resolved.

Those problems are being addressed by different international projects, driven by international co-operation between governments or commercial entities. For example, the BOLERO project aims to deal with the security and legislative issues based on the principles of a trusted third party, contractual legal infrastructure and cross-industry, global neutrality. Assuming the success of the project after its planned commercial launch in the autumn of 1999, it may affect the way the shipping industry and trade as a whole function today. Therefore, it is of great interest and importance for every company to follow (if not participate in) the project.

7.2. Information management in LISCO and LISCO Conline

Lithuanian Shipping Company has a fleet of 35 ships, consisting of 11 bulk carriers, 18 multipurpose/container vessels and 6 Ro-Ro/passenger ferries. Eighty percent of the company’s stocks are presently owned by the Government and it is in a process for privatisation. This opens new opportunities and challenges for the management of the company.

LISCO Conline has been opened in 1998 and since then operated between ports of Lithuania (Klaipeda), Belgium (Antwerp) and Germany (Bremen/Bremerhaven). Presently, the line is served by one of LISCO’s multipurpose container vessels, ”Gediminas”, capable to carry 254 twenty feet equivalent (TEU) containers.

Information is a very important factor in the success and smooth operation of the line. The hub for the information management is the line’s general agent ”Jurkontas”, located in the port of Klaipeda, Lithuania.

The information flow and its quality in the ports are the factors, which can increase or reduce a ship's turn-around time in port, time taken for customs clearance and thus directly affects the costs for all involved parties. Therefore, the possibility to use port information systems for the electronic exchange of information is of utmost benefit.

Presently, of all the line's ports of call only the port of Klaipeda does not have a port information system, which is seen as the biggest hindrance against the improvement of the line's information management. The agents in the ports of Bremen and Antwerp are using their respective port information systems (DBH and SEAGHA, respectively) and by this can utilise all possible cost savings given by such a system.

However, the situation in the port of Klaipeda is also improving. According to the port's investment plan, the implementation of the port information system should start in the year 2000 and the system should be in place by 2002. In addition, the line's general agent is aware of the information management advantages and necessities and looking for ways to utilise the potential cost savings. The company has identified the "Line" software package as the best option to fulfil its needs. The package has been developed by Softship Datenverarbeitung GmbH and cost in the region of 15,000 US dollars.

The situation in the Lithuanian Shipping Company is also improving. The company has fairly updated IT hardware and recently undertook extensive network upgrading, expanding network capacity from 10 to 100 Mb/s. The software side of the information management is being developed and maintained in-house, by an IT department, which employs 23 persons. The in-house system is based on the DOS environment and is rather out-dated, since it was first developed in mid-seventies. The biggest problems may be seen as the use of DOS environment (which is less user-friendly than Windows) and lack of the integration of the communication functionality. Sending of the fax, telex and e-mail is done by separate programmes, which are stand alone options.

As was emphasised in the paper, the biggest advantages and opportunities are coming from the IT possibilities to exchange information electronically. In LISCO the system is mostly used to store and process in-house information, with the possibility to share it inside organisation, however.

Furthermore, the company lacks clear strategies for the company itself and for IT matters in particular. The lack of company aims and objectives act as obstacles to development of the information system. The lack of IT awareness, which can be a threat to the company's development, is also seen by the fact that there is no IT representative on the board level.

Concluding, it may be seen that information management in LISCO and LISCO Conline, might or will be improved by:

- The development of a port information system in Klaipeda;
- Modernisation of the software used by LISCO and its partners;
- Utilisation of Internet technologies for the provision of interactive services to clients;
- Adoption of a clear strategy of company's IT objectives;
- Employing of an IT manager on the company's board of directors;

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ANNEX I

MARTRANS-Related Projects

Acronym	Title	EU Programme	Prime Contractor(s)	Users and Beneficiaries	Short Description
BoPCom	Baltic Open Port Communication	Transport RTD Programme	TZL Lübeck Germany	Ports, shipping companies, forwarders	Open platform for the cooperation in telematics and logistics in the Baltic area, interconnectivity and common data handling for cargo booking, dangerous goods, vessel movements, cargo location etc..
CA SSS	Concerted Action on Short Sea Shipping	Transport RTD Programme	NTUA Zografou Greece	Shipping companies, ferry operators, policy makers	State of the art in short sea shipping, definition of pilot projects and demonstrators, criteria for logistical efficiency, focal points for future developments.
CONTROL-C	Concepts for Transportation and Loading of Containers	BRITE/EURAM	STN Atlas Elektronik GmbH Hamburg Germany	Ports, equipment suppliers	Advanced cargo handling concepts for containers, optimization of port logistics for a container terminal using straddle-carriers.
COREM	Co-operative Resource Mangement	Telematics Application Programme	ISL Bremen Germany	Ports, forwarders, transportation companies	Multimedia demonstrators for the support of collaborative work in the transport area, interfacing of truck and port operations.

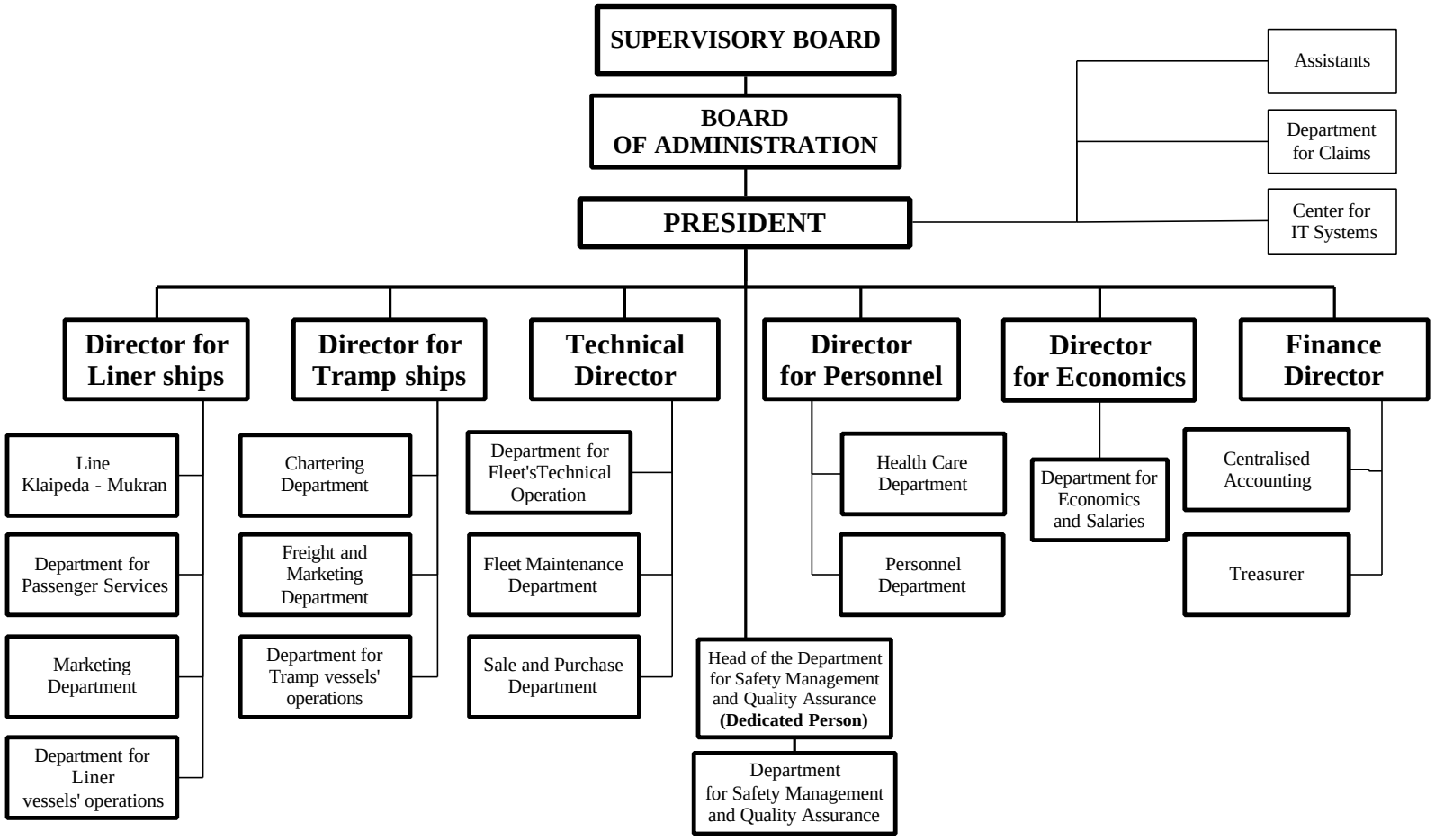
Acronym	Title	EU Programme	Prime Contractor(s)	Users and Beneficiaries	Short Description
EIES	European Information Exchange Service for the communication between harbour areas	ACTS	Eutelis Paris France	Ports, shipping companies, transportation companies	Development of services which support routine and non-routine communication between different players within harbour areas (harbour authorities, ship-owners, customs, fire brigade...).
EUROBORDER	The port as a hub in the intermodal chain	Transport RTD Programme	ISSUS Hamburg Germany	Ports, shipping companies, transportation companies	Analysis of intermodal procedures and interaction, preparation of ports for intermodal traffic, implementation proposals and impact analysis.
IMPULSE	Interoperable Modular Pilot Plants Underlying Logistic System in Europe	Transport RTD Programme	Krupp Fördertechnik GmbH Essen Germany	Intermodal transportation companies	Technical and economical analysis of intermodal requirements, pilot installations of harmonized intermodal technologies, analysis of resulting socio-economic effects, recommendations on implementation policies.
INDRIS	Inland Navigation Demonstrator for River Information Services	Transport RTD Programme	Ministry of Transport, Public Works and Water Management Rotterdam Netherlands	Maritime authorities, shippers, port operators	VTMIS demonstrator for inland navigation which involves the definition of RIS (River Information Services).

Acronym	Title	EU Programme	Prime Contractor(s)	Users and Beneficiaries	Short Description
INTERPORT	Integrating Waterborne Transport in the Logistics Chain	Telematics Application Programme	TFK Transportforschung GmbH Germany	Ports, shipping companies, transportation companies	Developments for the improvement of transport networks by telematic technologies, focus on RO/RO cargo handling.
IPSI	Improved Port Ship Interface	Transport RTD Programme	Kvaerner Ships Equipment Lier Norway	Ports, intermodal transportation companies, shipbuilders, equipment suppliers	Concepts for flexible port/ship interfaces, methods and equipment for an effective transfer of cargo and cargo-related information, multimodal cargo demonstrator.
MAGNET-B	MAGNET-B	Telematics Application Programme	Dassault Electronique France	Intermodal transportation companies	Development of navigation satellite user segments, field tests and additional user modules for all transport modes.
MULTITRACK	MULTITRACK	Telematics Application Programme	BIS Strategic Decisions United Kingdom	Transportation companies	Development of an end-user-oriented information network for the monitoring of location and status of cargo in inter-modal systems using technologies for cargo identification, fixed and mobile communication, databases and data relay.

Acronym	Title	EU Programme	Prime Contractor(s)	Users and Beneficiaries	Short Description
PROSIT	Promotion of Short Sea Shipping and Inland Waterway Transport by use of Modern Telematics	Transport RTD Programme	Senator fur Hafen Bremen Germany	Transportation companies, ports	Support of intermodal brokerage for linking and tuning the demand and supply side in transport including short sea shipping and inland waterway transport; improvement of quality and reliability of short sea shipping and inland waterway transport and it's integration into intermodal transport chains.
SHIDESS	SHIDESS	Telematics Application Programme	DATAMAT Italy	Ship owners	Specification and design of an integrated ship decision support system, development of concepts for data fusion and predictive maintenance in order to reduce operational costs.
SPHERE	Small/Medium Sized Ports with Harmonized, Effective Re-engineered Processes	Transport RTD Programme	TRD International Thessaloniki Greece	Ports, shipping companies, forwarders	Development of a generic operational and organisational framework for small/medium sized ports, scenarios within a virtual test site using a port process simulation tool, socio-economic and educational impacts of the reorganization processes.

Acronym	Title	EU Programme	Prime Contractor(s)	Users and Beneficiaries	Short Description
STEMM	Strategic European Multi-Modal Modelling	Transport RTD Programme	Baxter Eadie Ltd. Richmond, Surrey United Kingdom	Intermodal transportation companies, policy makers	Development of a methodology for the modelling of intermodal chains, application of the methodology to European networks, analysis of customer demand and regulatory framework, support for policy decisions.
TRACAR	TRACAR	Telematics Application Programme	Mercury Communications Ltd. United Kingdom	Intermodal transportation companies	Establishment of a common standard and telematic system for the identification, positioning, supervision and management of cargo units in a multi-modal setting.

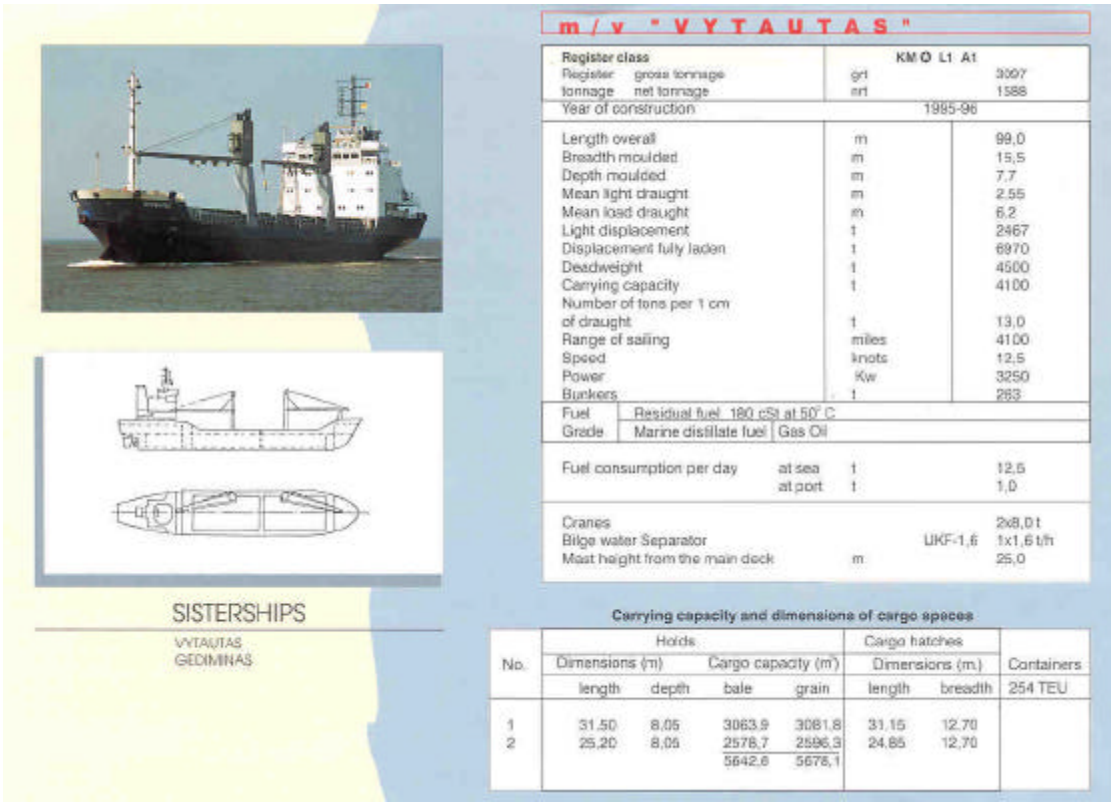
ANNEX II. LISCO ORGANISATIONAL CHART



Source: LISCO internal documents, 1999

ANNEX III

Characteristics of the 'Vytautas' type vessels



m / v "VYTAUTAS"

Register class			KM ⊙ L1 A1
Register tonnage	gross tonnage	grt	3097
	net tonnage	nrt	1588
Year of construction			1985-96
Length overall		m	99,0
Breadth moulded		m	15,5
Depth moulded		m	7,7
Mean light draught		m	2,55
Mean load draught		m	6,2
Light displacement		t	2467
Displacement fully laden		t	6970
Deadweight		t	4500
Carrying capacity		t	4100
Number of tons per 1 cm of draught		t	13,0
Range of sailing		miles	4100
Speed		knots	12,5
Power		Kw	3250
Bunkers		t	283
Fuel	Residual fuel 180 cSt at 50° C		
Grade	Marine distillate fuel	Gas Oil	
Fuel consumption per day	at sea	t	12,5
	at port	t	1,0
Cranes			2x8,0 t
Bilge water Separator		UKF-1,6	1x1,6 t/h
Mast height from the main deck		m	25,0

SISTERSHIPS

VYTAUTAS
GEDIMINAS

Carrying capacity and dimensions of cargo spaces

No.	Holds				Cargo hatches		Containers
	Dimensions (m)		Cargo capacity (m³)		Dimensions (m.)		
	length	depth	bale	grain	length	breadth	254 TEU
1	31,50	8,05	3063,9	3081,8	31,15	12,70	
2	25,20	8,05	2578,7	2596,3	24,85	12,70	
			5642,6	5678,1			