BALTIC Transport Communication and Regional Development

Deliverable 12.1

Evaluation and further recommendations

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This report is a deliverable within the BALTICOM project. The conclusions and opinions expressed are the authors’ own.

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Abbreviations and Special Terms

**ACTION** Agents' Container Transport Improving and Organizing Network (software component of DAKOSY)

**AIS** Automatic Identification System for vessel position and heading

**B2B** Business to Business

**B2C** Business to Consumer

**Baltic states** All countries bordering the Baltic Sea

**BSR** Baltic Sea Region

**DAKOSY** Datenkommunikationssystem AG (Data Information System, Port of Hamburg)

**DB** Deutsche Bahn (German Rail Operator)

**DG** Directorate General (of the European Union)

**D x.y** Deliverable of the BALTICOM project; x = workpackage, y = number of deliverable

**E-BSR** Eastern Baltic states: Lithuania, Estonia, Latvia, Russia

**EDI** Electronic Data Interchange

**EDIFACT** Electronic Data Interchange for Administration, Commerce and Trade

**EDP** Electronic Data Processing

**ESDP** The EU Commission’s “European Spatial Development Perspective”

**ETA** Estimated Time of Arrival

**GEGIS** IT system for dangerous goods of the Port of Hamburg

**HABIS** Disposition system for railway wagons in the port of Hamburg

**HAZMAT** European directive regarding dangerous cargo transport

**ICT** Information and Communication Technology

**IFTxxx** Specific set of EDIFACT transport related messages

**IMDG** Regulation regarding transport of hazardous cargo on sea

**IT** Information Technology

**JDBC** Specific database access system

**LoCo** Local Consumption (proportion of cargo for which a defined geographical area is source or sink)

**MATROS** INTERREG IIC project

**OECD** Organisation for Economic Cooperation and Development

**PKP** Polish State Railways

**POLZUG** Trade mark for block train operation between Hamburg and Poland

**Port@Net** National Finish port community system

**PortIt** Port community system, developed and adopted by Swedish ports

**PROTECT** EU-Project for the exchange of dangerous goods data between ports

**SEBtrans** INTERREG IIC project

**SWOT** "Strengths – Weaknesses – Opportunities – Threats"

**TCIS** Transport Chain Information System

**TEAMLINES** Feeder line operating in the Baltic Sea

**TEN-programme** Trans European Network - support action of the EU
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<td>Twenty-Foot Equivalent Unit (container standard)</td>
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<td>TransLogis</td>
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<td>Software acronym: Universal Interface for Communication with all Participants in Transport</td>
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<td>VAN</td>
<td>Value Added Network; IT service provider</td>
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<td>VASAB 2010</td>
<td>Vision and Strategies around the Baltic Sea</td>
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<td>VTS</td>
<td>Vessel Traffic Service(s)</td>
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<td>VTMIS</td>
<td>Vessel Traffic Management and Information Service(s) (or Systems)</td>
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<td>WADIS</td>
<td>Disposition system for railway wagons in the port of Bremen</td>
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<td>WPx</td>
<td>Work Package of the BALTICOM project, x = number of package</td>
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<td>XML</td>
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1 Executive Summary

1.1 IT to support the development of maritime transport in the BSR

BALTICOM (BALTIC Transport Communication and Regional Development) is one of the projects funded within the framework of INTERREG II C which was carried out between March 1999 and April 2001. The main idea was to show which impact new information technology may have on spatial development. A deeper understanding of these connections will contribute to a sustainable development in the BSR. The overall objectives of the BALTICOM-project were:

- assessing the economical, environmental and regional impact of modern information and communication technologies within maritime transport economy
- promoting sustainable transport facilities, chains and corridors within the BSR, especially with respect to the Eastern European countries
- increasing transnational co-operation and the competitiveness of companies in the Baltic Sea Region by pilot demonstrations
- implementing new networks between transport companies, scientific organisations, and Baltic port cities in order to maintain and develop port functions, hinterland transports and a balanced city system in the BSR.

1.2 A partnership covering the BSR

The backbone of BALTICOM is the partnership of national and regional authorities forming an international Baltic partnership aiming at the promotion of sustainable transport links in the Baltic Sea Region. BALTICOM brings together partners from Germany, Finland, Sweden, Poland, Lithuania and Russia under the lead partner, the Free and Hanseatic City of Hamburg represented by its Ministry of Economic Affairs.

The consortium provided a productive environment for addressing the rather complex tasks ranging from concrete implementations of IT-solutions to theoretical analyses of the impact on regional development. The approach of BALTICOM made it interesting for the transport industry to participate, which contributed to a unique blend of private companies, authorities and research organisations in the consortium. The participation of the private
sector provided valuable input regarding problems and needs as well as providing channels for implementing the results.

### 1.3 A bottom-up approach

The work in BALTICOM investigated the implications new transport infrastructure and information and communication technologies might have on spatial development on an urban and regional scale in the BSR. Seven pilot applications provided input for the assessments, illustrating the impact of specific IT solutions in concrete transport chains. Supporting information and experiences were derived from four regional case studies which investigated the impact of structural changes in transport on the development of port regions in Finland, Poland, the Baltic states, and Germany.

### 1.4 Recommendations for actions

**Modernise the maritime transport system**

Maritime transport in the BSR suffers from the general problem of developing EU short sea shipping to a mode which is competitive to rail and road transport. In addition it has to cope with the very practical consequences of the heritage of the division of Europe. On the other hand, the imminent enlargement of the European Union with the integration of Poland and further states of the Baltic Sea Region offers a unique opportunity to promote a new, efficient and sustainable transport system, where maritime transport has a major role. That is why BALTICOM proposes a general strategy to modernise the maritime transport system in the BSR. The emphasis is on the word “system”, which implies a combination of actions on infrastructure, technology, organisation and procedures involving all relevant public and commercial parties.

The expected increase of transport volumes will not be manageable by rail and road modes only. The BSR needs an efficient maritime transport system able to compete with the land modes for the rapidly growing transport needs in the region. Good port and hinterland infrastructure is important, but BALTICOM results show that improvements in procedures and organisation might be as important and that they can produce rapid and tangible results.
Information technology (IT) has a crucial role in this process of modernisation. It is needed by the players if they want to stay competitive, if intermodal and maritime transport shall have a chance to compete with the truck, if administrative procedures are to be improved and if the necessary control mechanisms shall be cost-efficient or at least fulfil minimum standards in a traffic environment rapidly growing more complex.

The following text outlines some of the actions proposed by BALTICOM.

**Support IT development among the small players**

IT can contribute to a sustainable, intermodal, interoperable and interconnected transportation network within the Baltic Sea Region. A network which has positive effects on the competitiveness, cohesion and environment in a highly dynamic region, which will be fully integrated into the European Union within a few years. IT can make better use of available infrastructure and support procedural harmonisation. BALTICOM argues that IT is needed by all parties in the transport chain if they want to stay in business. But it has also been shown that implementing IT systems is costly in time and money which may deter the small players, including the small ports, from investing. This may lead to a concentration of traffic to the big companies and the major ports and lead to a geographical concentration of transport expertise and transport volumes. It should be considered how to support a more widespread use of IT across all type of organisations. The need for better use of IT is also emphasised by the emerging e-commerce activities, which outlines a future scenario where the internet becomes the market place.

**Harmonisation also in practice**

The need for harmonisation of general rules and regulations, procedures, conventions and even documents in cross-border (transport) operations is evident also within the EU and especially in the BSR. The transformation process to a true inner market must be fostered through the creation of a harmonised legal and regulative environment. Many efforts are underway, but experiences in BALTICOM and elsewhere show, that more emphasis has to be put on monitoring and aligning the practical applications of such rules and regulations, if the Baltic is to become a true “EU-Sea”. IT can support this process by supporting standardised procedures and reducing arbitrary decision making.

**Improve co-operation in vessel monitoring**

Environmental protection in the Baltic is an another issue with a cross border regulatory perspective. The already dense maritime traffic is a heavy burden on the very sensitive environment in and around the Baltic. Increased trade will increase vessel traffic and in
consequence augment pollution and the risk for accidents. The Russian port development alone is expected to increase sea traffic in the Baltic within 5-10 years by more than 45%. BALTICOM has highlighted the efforts to improve vessel traffic management and information services (VTMIS). Safety and efficiency gains have been proven, but progress in the necessary international cooperation is slow due to lack of agreements ranging from services to be supported to technical design, in spite of the recognised need for more efficient supervision of existing regulations.

**Careful assessment of the need for public involvement in port operation**

Ports and their (public) owners should carefully assess their future role in the transport network of the BSR. Public involvement in operational activities should be carefully considered, not only because of the EU-proposals for increasing fair competition, but also in order to make the best use of tax money. A clear distinction between public responsibilities and private business objectives is desirable and will help a proper allocation of costs and benefits and the related risks.

**Long term planning needs transport market understanding**

Regional authorities concerned with port development should strengthen their role as catalysts for facilitating transport handling and information exchange. Bringing business and public interests together with specialists of different backgrounds is a way to support a creative co-operation promoting economic development, competence and jobs. At the same time, such activities create the network needed for assessing the future and developing the skills and services needed. BALTICOM is a good example of how such an effort could be organised to support both concrete technical improvements and an understanding of future development scenarios including the needs for spatial planning.

**A monitoring system for commercial and public needs**

The expansion and improvement of sea-based mobility of goods and supporting infrastructures should be emphasised in initiatives of spatial planning within the Baltic Sea Region. BALTICOM also suggests to install a monitoring system within the BSR to observe and assess physical flows of goods in order to build an appropriate data base for transportation and communication planning purposes. Improved data which is easy to access would improve planning possibilities. A “BSR transport network monitoring system” would help planners across the Baltic. With the right type of data such a system would also be of use for business decisions and then also be commercially viable.
2 Introduction

2.1 Background

The INTERREG IIC Baltic Sea Region (BSR) Programme combines the objectives of VASAB 2010 with the Commission’s “European Spatial Development Perspective” (ESDP) and the regional development requirements identified by the Nordic Council of Ministers. The underlying idea of INTERREG IIC BSR is to increase competitiveness of enterprises and improve living conditions for the people within the BSR. This might be reached by intensified national and private co-operation across the BSR.

BALTICOM is one of the projects which set out to meet these objectives within the framework of INTERREG II C. The project was carried out between March 1999 and April 2001. The overall objectives of the BALTICOM-project are:

- assessing the economical, environmental and regional impact of modern information and communication technologies within maritime transport economy
- promoting sustainable transport facilities, chains and corridors within the BSR, especially with respect to the Eastern European countries
- increasing the transnational co-operation and the competitiveness of companies in the Baltic Sea Region by pilot demonstrations
- implementing new networks between transport companies, scientific organisations, and Baltic port cities in order to maintain and develop port functions, hinterland transports and a balanced city system in the BSR

BALTICOM analysed

- what kind of implications new transport infrastructure and applied communication technologies might have on spatial development on an urban and regional scale
- four pilot applications illustrating specific examples for improved transport chains, and
- four regional case studies which investigated the impact of structural changes on the development of port regions in Finland, Poland, Russia and Germany

This report summarises the findings of BALTICOM. It reports concrete benefits and disadvantages of the pilot IT implementations and analyses different regional initiatives to promote competitiveness of ports and maritime transport routes. The concluding discussion addresses the spatial effects of the technological changes studied and the prerequisites for
term planning to be able to support sustainable transport under realistic business and environment conditions.

2.2 Approach

The „European Spatial Development Perspective (ESDP)“ together with strategies derived from „Vision and Strategies around the Baltic Sea 2010“ (VASAB 2010) are based on the idea to conduct sector policies by integrating them into their spatial context and to monitor how they interact. Building on this principle the regional evaluation within BALTICOM followed different approaches in order to analyse complex systems of interactions in three spatial perspectives.

**A first perspective** has to deal with the regional situation and its relation to physical and informational flows within the BSR and their relation to the global economy. The spatial perspective applied here includes highly developed regions of the European Union – both in terms of welfare standards and transport and communication intensities - as well as less developed regions in economies of transformation.

**A second perspective** is related to the spatial impacts of new IT-Technologies to port cities, their relations within the BSR and their respective hinterlands. On the one hand these impacts may have a systematic character like common productivity improvements which lead to similar effects in all regions under investigation. On the other hand spatial impacts of new IT concepts are transformed by the existing spatial setting and are therefore specific within the regional context.

**This leads to the third perspective** which addresses those changes within the regions of the BSR directly or indirectly induced by technological changes.

The three approaches are analytically divided here and find a certain reflection within the order of the workpackages of BALTICOM. In reality the integration of sectoral aspects and the interaction of elements of IT are complex and not possible to reduce to a simple model of cause and effect linkages.
2.3 Methodological architecture of BALTICOM

BALTICOM has developed several approaches to address recent changes in the use of IT, the actors involved and spatial issues. The methodological architecture is threefold:

- Systematic analysis of the relations between technologies, actors and regional development
- Case studies to reveal the invention and early adaptation of new technologies or the improvement of existing technologies
- Regional case studies for different types of port area located in EU- and non EU-states

The systematic analysis tried to build on reliable overall statistical data and generalised empirical findings. This research has to face the problem of an unsufficient data base especially when different regions of the BSR are directly compared. Particularly two fields of deficits have been revealed:

- The flows of goods between ports may not be analysed in a comparable way and different studies calculate figures which are incompatible as a reliable source for projecting programmes and actions
- The relation of cargo handling between vessel, lorry and train is rather unclear. Therefore it is impossible to give reliable assessments concerning important regional differences within the competition between different transport modes

BALTICOM suggests to install a monitoring system within the BSR to observe and assess physical flows of goods to build up an appropriate data base for transportation and communication.

The methods for the case studies included are rather heterogeneous as for example interviews, statistical data analysis, pilot applications, programming tools and a variety of project planning methods. A number of quantitative and qualitative indicators were used to assess the pilot applications implemented. Each application was analysed with respect to the following aspects:

- improved transport speed through reduction of waiting time and delay times
- improved transport and data reliability
- illustration of the costs and benefits of the new system for shippers and other transport companies
- improvement of quality concerning offered transport services
- improved information flows
• raised degree of diffusion of new and innovative technology in the BSR
• reduced impacts of increasing volume of transport in the environment
• improved co-ordination of regional planning and transport planning

2.4 The Partnership

BALTICOM brings together partners from Germany, Finland, Sweden, Poland, Lithuania and Russia.

The BALTICOM consortium consists of

• national and regional authorities involved in planning and research as well as transport and communications,
• public and private research institutions
• external private partners from the transport industry and information service providers

It turned out that the combination of these groups of partners produced a productive environment for project results of practical relevance. A list of participants with contact information is annexed to this document.

2.4.1 The Regional and National Backbone

The backbone of BALTICOM is the partnership of national and regional authorities which have joined this project to form an international Baltic partnership which has been aiming at the promotion of sustainable transport links in the Baltic Sea Region, especially in maritime transport.

The project was initiated and led by the Hamburg State Ministry of Economic Affairs which is also responsible for maritime transport relations and port development in the City of Hamburg. Furthermore, the Hamburg State Ministry of Science and Research as well as Hamburg State Ministry of Urban Planning and Regional Development gave support for the project on the German side.

From the Finnish side, the project was supported on national and regional level. The Finnish Ministry of Transport and Communications significantly supported the project
activities. The spatial issues were accompanied by the Finnish Ministry of Environment. The project activities on regional level in Finland were guided by the Regional Councils of Ostrobothnia, Southern Karelia and Kymenlaakso. The ports of Vaasa, Kotka and Hamina brought in their views on the situation of the small Finnish ports.

The Port of Stockholm was the Swedish BALTICOM partner. It was involved in the development of cross-border information exchange with the German port of Hamburg and the feeder line Teamlines and the development of a dangerous goods information systems.

2.4.2 Research Institutions

The public and private research institutions carried out the regional and technical studies as well as the design and implementation of the technical pilot applications.

- Heusch/Boesefeldt co-ordinated the overall project
- The University of Hamburg was responsible for the investigation of regional restructuring and the impact of information and communication technologies as well as for the regional case studies in northern Germany as well as in Gdansk and Klaipeda
- The Technical University of Hamburg-Harburg planned and developed the pilot system in forestry products transport
- The Institute of Ship Operation, Maritime Transport and Simulation Hamburg investigated the situation concerning Vessel Traffic Management in the Finnish Gulf
- Viatek OY co-ordinated the regional and technical cases on the Finnish side
- TFK Transport Research supported the Port of Stockholm with the implementation of pilot applications and co-ordinated the evaluation work
- HPC Hamburg Port Consulting designed a pilot application for the POLZUG container block train case

In the eastern BSR, the project received support from the Universities of Gdansk (Poland) and Klaipeda (Lithuania) as well as the Central Maritime Research and Design Institute St. Petersburg (Russia).
2.4.3 Actors from the transport Industry and information service providers

BALTICOM has benefited from close contacts and contributions of partners from the transport industry and information service providers. This turned out to be a sound basis for successful technical implementations and practical and tangible project results.

The main industrial partners involved were

- DAKOSY Datenkommunikationssystem (information service provider at the Port of Hamburg)
- POLZUG Poland-Hamburg Transport (container block train operator)
- Team Lines (feeder shipping line)
- Cellpap Terminal Kiel (port terminal operator).
- Walter Lauk (forwarder)
- Rautarukki (steel mill)

During the project, further co-operation partners were found which are valuable partners in the BALTICOM partnership, e.g. Tieto Enator (operator of the Finnish Port@net), Portit (systems provider for Swedish ports), the Polish State Railways, Krantas Shipping (Lithuania).

2.5 The Overall Structure of BALTICOM

The actions in BALTICOM were centred on the main question how information and communication technologies can influence maritime transport relations in the Baltic sea region in technical and regional terms.

The project produced the following kinds of results:

- reports of regional studies
- technical pilot applications in maritime transport
- reports on technical pilots
- specific partnerships for the development of relevant solutions

The structure of the project reflects this approach. Illustration 1 shows this project structure.
The Workpackage 3 (WP3) was mainly aiming at collecting information about the ongoing regional restructuring process in the Baltic Sea Region, the investigation of the tendencies in transport and trade development and the possible impact of information and communication technologies in maritime transport. Thus, this WP has delivered necessary background information for the spatial environment for the case studies which have been done. More detailed information on the findings of this WP can be found in the reports D3.1, D3.2 and D3.3.

Workpackage 4-7 have produced technical pilot applications which are physically available. All these pilot applications tackle real problems in maritime transport concerning information technology use.

Workpackage 4 has introduced an EDI connection for Small and Medium Enterprises for steel transport between Finland and Hamburg. Furthermore information procedures in customs data exchange have been planned and partially agreed upon between Hamburg
and Finland. Finally, the exchange of dangerous goods data was tested in the same relation. This is backed by a well functioning co-operation which has been established by BALTICOM. More details can also be found in the reports D4.1, D4.3, D4.4.

Workpackage 5 has developed the internet-based Transport Chain Information System (TCIS) which is now ready for implementation. The work started with the investigation of the whole transport chain across the Baltic Sea in forestry products transport between northern Germany, the Baltic states and Russia. The aim of this pilot system is to enable transparency throughout all sections of a transport chain for transport planning and supervision. More details are available from reports D5.1 and D5.3.

Workpackage 6 has established an EDI data exchange for container block train operation between the port of Hamburg and various container depots in Poland. This is an example for the improvement of the information flow in port hinterland relations. More details are available from the reports D6.1, D6.3 and D6.4.

Workpackage 7 has introduced an EDI connection in container feeder shipping in the port of Stockholm. Furthermore, BALTICOM produced a pilot system for the management of dangerous goods locations in the port of Stockholm. This system has been produced in a co-operation between the ports of Hamburg and Stockholm using the experience available in Hamburg. More details are available from the reports D7.1 and D7.1b.

The workpackages 8 to 11 are regional case studies within the Baltic Sea Region on Finland, northern Germany, Gdansk and Klaipeda as well as St. Petersburg. As a continuation of Workpackage 3 in example regions, they investigate regional conditions for maritime transport and the implementation of information and communication technologies on regional level.

Workpackage 8 concentrates on the Finnish Regions of Kotka/Hamina (Southern Karelia, Kymenlaakso) and Vaasa (Ostrobothnia). Both regions have smaller ports. The Vaasa case investigated the possibilities to attract more maritime traffic to the port of Vaasa. For the Kotka/ Hamina region, an investigation of transport flows in the Finnish gulf has been carried out in order to evaluate future chances for these ports. Furthermore this Workpackage gave Finish national support for the cross-border pilot development in dangerous goods, customs and container transport applications. Further details can be drawn from the reports D8.1, D8.2, D8.3 and D8.4.

Workpackage 9 evaluates the situation in northern Germany with the focus on the regional potential of the Port of Hamburg. The reports D9.1 and D9.3 provide more details.
Workpackage 10 focuses on the Finnish gulf and gives an overview of the available vessel traffic control systems and the preconditions for vessel traffic management in the area. Special attention was given to the systems in St. Petersburg and Russia. Vessel Traffic Control systems can have a substantial impact on environmental protection and maritime transport safety. The reports D10.1, D10.2 and D10.3 describe the results of the study.

Workpackage 11 describes the situation in the port regions of Gdansk and Klaipeda concerning transport opportunities. This study is an example for an investigation in transformation areas in the eastern BSR. The reports D11.1 and 11.2 describe the results.

Workpackage 12 is summarising the findings of the case studies. In this report conclusions from the project work are drawn.

2.6 INTERREG II C co-operation

In order to support the overall INTERREG IIC objectives, BALTICOM established a close co-operation with similar projects funded by the INTERREG IIC BSR and other EU programmes such as:

- TransLogis strives to strengthen the integration of spatial planning and regional transport development in Skåne-Mecklenburg-Vorpommern-Berlin-Brandenburg-Westpomerania and develop a common regional approach to the issue of sustainable logistics solutions. TransLogis puts considerable emphasis on Berlin in the international, national and regional transport networks including inland waterways. Freight terminals including ports and freight villages play an important part in these networks.

- SEBtrans promotes the use of transport corridors, modes and technologies which support a sustainable regional development supporting the economic and social development of the regions in the south-east part of the Baltic. The transnational co-operation aims at assessing trade and transport potentials and develop environmentally friendly transport solutions.

- MATROS looks at the role of waterborne transport in the BSR and has identified a set of challenges which future planning has to meet. One of these is how to ensure that the corridors across the Baltic are stable enough to promote economic cooperation. What is asked for is in fact a set of links between the TINA-networks in the east and the TEN in the west.
The main focus of the USUN (Urban Systems Urban Networks) project was to give a wide overview about recent upcoming networks between cities and their potential for further development. USUN had identified waterborne transport as an important means to establish and develop the city networks and the cohesion necessary for economic development.

Readers of the final reports from the projects mentioned above will find that similar issues for action are raised, in spite of widely different starting points.
3 IT- pilot applications in the transport sector

3.1 IT use for Baltic ports

3.1.1 What is “IT use”

Information technology (IT) is expected to have an impact on the demand for physical infrastructure and thus affect regional planning prerequisites. Better utilisation of traffic and transport capacity contributes to socio-economic and enterprise efficiency. However, IT may also have consequences on the way that organisations co-operate and compete, which in turn may have spatial effects.

BALTICOM is focused on the use of IT for information exchange between the partners in an intermodal transport chain, where one link is waterborne transport. IT use has significant impact on costs associated with information handling and distribution. Furthermore it affects internal company organisation and opens new opportunities for networking between companies.

EDI (electronic data interchange) is often used to specifically signify information exchanged according to the EDIFACT standard. Till the arrival of Internet such message exchange via proprietary networks (VANs) was the standard way of securely exchanging data between two non-identical information systems. The uptake of EDIFACT message exchange, however, has been slow outside the big organisations. The internet promises to provide a less costly and complicated message system, eventually developing into an electronic market place.

Nowadays, EDIFACT messages can also be sent as attachments to e-mails. Also, EDIFACT messages can be converted to XML and sent as e-mails. In both cases manual intervention may be necessary, but in BALTICOM a fully automated system based on EDIFACT and e-mail was implemented (see chapter 3.2 for details). XML messaging is still burdened with standardisation problems and in addition considered less secure than EDIFACT, at least at present.

Describing the use of IT in the ports of the BSR could be done from several perspectives:

- What procedures/functions are supported by IT (quotations, hazardous goods reporting, customs declaration, manifest transmission, berth request, pick-up order etc....)?
• Which are the parties exchanging information? Within the port (between terminal operators, authorities, port administration), or between these parties and their "customers"?

• Which are the technical solution considered? Are messages exchanged between (in-house) systems or are the parties accessing a common data base?

• What is the format of the information exchanged? Flat files, EDIFACT standard messages (how many are implemented and with whom), e-mails or XML messages via the web?

3.1.2 Numbers on IT use

In 1998, the EU study “COST 330 Teleinformatics links between ports and their partners” found that the use of EDI in Europe was still fairly limited. The study was conducted by a questionnaire throughout 19 European countries (among these Germany, Denmark, Sweden and Finland). All in all, approximately 700 port related companies in 77 sea ports (of which 23 were within the western part of the BSR) and 29 inland waterway ports participated and were analysed in the COST 330 Action.

At that time only 28 port authorities and 27 terminal operators used EDI. Hardly any trucking companies and only two national railway companies in Europe used EDI for their communication with ports. The most common information transmitted by the 28 port authorities were cargo manifests (17), dangerous goods information (8), berth allocation (7), invoicing (5), stowage plans and time schedules (3 each). The most important EDI messages transmitted by the 27 terminal operators were cargo manifests (23), stowage plans (13), dangerous goods data (6) and time schedules (3). Unfortunately, no more detailed analysis of the situation within the Baltic Sea region was made. Thus, it is not possible to draw conclusions about the development since then.

A small survey of the BALTICOM project amongst 38 Baltic Sea ports provided some insight in the way that EDI is used in the BSR. 17 of 38 ports answered the BALTICOM questionnaire. While the data situation is quite good for Sweden, Finland, Germany and Denmark, almost all ports in Russia, the Baltic states and Poland refused to provide information. There are diverse reasons for the low rate of responses. While the missing ports in Germany and Denmark in principal are reluctant to participate in this kind of research projects, the ports in the Eastern European states named reasons like “not received” and “no time”. Moreover, inflexible and bureaucratic systems prevented a timely response.

As one can see from the D5.1 report it is not likely that the use of EDI is widespread in the Eastern European countries. According to information from TEAMLINES, the company is interested in replacing the manual communication to their partners with EDI. Thus, it is likely that systems like the one implemented in the Port of Stockholm will soon be established in other Baltic Sea ports served, too.

Actually, nine Sea ports in Sweden, Denmark and Finland use EDIFACT messages for their communication with other transport companies. A further nine ports in these countries have plans to invest in EDI within a two year perspective. That means that almost all ports in these countries that participated in the field study will use EDI at the end of 2003.

More detailed and port related results from the survey can be seen in the following figure.
### Evaluation and further recommendations

#### Table 1: Use of EDI in Baltic Sea ports

<table>
<thead>
<tr>
<th>Port/Terminal</th>
<th>Use of EDIFACT messages</th>
<th>Type of message</th>
<th>Type of platform</th>
<th>Number of interchanging partners</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>yes</td>
<td>no</td>
<td>planned (year)</td>
<td></td>
</tr>
<tr>
<td>Sweden</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Walhann</td>
<td>x</td>
<td></td>
<td></td>
<td>CUSTEC</td>
</tr>
<tr>
<td>Uddevalla</td>
<td>x</td>
<td></td>
<td></td>
<td>CODECO, COARRI, COPARN, BAPLIE</td>
</tr>
<tr>
<td>Gothenburgh</td>
<td>x</td>
<td></td>
<td></td>
<td>COPAR, COARRI, CODECO, under construction: COPARN, BAPLIE</td>
</tr>
<tr>
<td>Helsingborg</td>
<td>x</td>
<td></td>
<td>maybe</td>
<td>AS/400</td>
</tr>
<tr>
<td>Karlshamn</td>
<td></td>
<td></td>
<td>2001</td>
<td>AS/400</td>
</tr>
<tr>
<td>Norrköping</td>
<td>x</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Soedertalje</td>
<td>x</td>
<td></td>
<td></td>
<td>CUSDEC, CUSRES</td>
</tr>
<tr>
<td>Stockholm</td>
<td>x</td>
<td></td>
<td></td>
<td>COPRAR</td>
</tr>
<tr>
<td>Gävle</td>
<td>x</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sundsvall</td>
<td>x</td>
<td></td>
<td>maybe</td>
<td></td>
</tr>
<tr>
<td>Finland</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rauma (Rauma Stevedoring)</td>
<td>x</td>
<td>2001</td>
<td>Inhouse messages exchanged with the forest industry carriers. EDIFACT in use during year 2001</td>
<td>AS/400</td>
</tr>
<tr>
<td>Turku (Finnsteve)</td>
<td>x</td>
<td>2001</td>
<td>BABELIE, COPRAR, COARRI, CODECO, XML-ASTAP, XML-EDI-COPARN, IFTMBF, DESADV, IFTMEX, IFTMDC, IFTMPC, INVOICE</td>
<td>AS/400</td>
</tr>
<tr>
<td>Hanko (Hangö Stevedoring)</td>
<td>x</td>
<td>2001</td>
<td>CUSCAR, CUSREP, IFTDGN, IFCSUM 91.1, WAYEND, IFTMCS D94B</td>
<td>AS/400</td>
</tr>
<tr>
<td>Helsinki (Finnsteve)</td>
<td>x</td>
<td>2001</td>
<td>BABELIE, COPRAR, COARRI, CODECO, XML-ASTAP, XML-EDI-COPARN, IFTMBF, DESADV, IFTMEX, IFTMDC, IFTMPC, INVOICE</td>
<td>AS/400</td>
</tr>
<tr>
<td>Kotka (Steveco)</td>
<td>x</td>
<td>2001</td>
<td>Steveco will answer asap.</td>
<td>AS/400</td>
</tr>
<tr>
<td>Hamina (Hamina Multimodal Terminal)</td>
<td>x</td>
<td>2001</td>
<td>Expected 3-4</td>
<td>AS/400</td>
</tr>
<tr>
<td>Germany</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rostock</td>
<td>x</td>
<td></td>
<td>maybe</td>
<td></td>
</tr>
<tr>
<td>Lübeck</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Kiel</td>
<td>x</td>
<td></td>
<td>2001/2002</td>
<td>Dangerous goods information, Customs information</td>
</tr>
<tr>
<td>Copenhagen</td>
<td>x</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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Table 1: Use of EDI in Baltic Sea ports
3.2 Evaluation of the technical case studies

3.2.1 Overview of case study results

The evaluation across the BALTICOM implementations was difficult to conduct in terms of defining common ratings, success levels, etc. The range covered by the project is too widespread, and in fact covers anything from more experimental considerations (e.g. “logistics systems in raw material cargo”, see 3.2.3) right through to full blown implementations (e.g. the POLZUG case, see chapter 3.2.4). Nevertheless, the evaluation which is part of each of the cases (see the relevant deliverables in each workpackage) have been guided by a common understanding which can be summarised as follows:

- To understand were the operators of the pilot cases come from, so as to understand how the operations looked like before BALTICOM
- What the motivation was to change existing or to introduce new systems
- What the internal goals were, i.e. what the pilot partners expected from engaging into BALTICOM
- How the new systems were put into practice, i.e. how new systems or system elements look, what the general layout and the systematics behind it are
- What effort it took, i.e. what technical and organisational work had to be undertaken to achieve the goal
- Which effects (wanted and unwanted) were experienced. This point accounts for the fact that any new installation will have predicted and expected effects, but also some which surprised the implementers
- If and to what extent the goals were achieved, because the degree of achieving goals will vary
- What additional experience and spin-off effects (like requirements for further developments) are caused by the implementations.

The above listing bears principal relevance for all technical BALTICOM implementations. The special study of the impact of vessel traffic management information in the Finnish Gulf falls outside the technical implementations as it is focusing on the functional aspects and the related need for international co-operation.
**Evaluation and further recommendations**

<table>
<thead>
<tr>
<th>WP</th>
<th>Subject</th>
<th>Status</th>
<th>Deliver.*</th>
</tr>
</thead>
<tbody>
<tr>
<td>4</td>
<td>Intermodal transport. EDI connection between manufacturer in Finland and forwarder in Germany, customs procedures</td>
<td>Implemented and operational. Successful bridging of company-owned system, integration of port community system, awareness for customs procedure improvements</td>
<td>4.3, 4.4, 8.4</td>
</tr>
<tr>
<td>5</td>
<td>Forest products: transport chain management</td>
<td>Analysis of regional structure, design of a transport chain management software. Development of a demonstration tool.</td>
<td>5.2, 5.3</td>
</tr>
<tr>
<td>6</td>
<td>POLZUG: EDI link</td>
<td>Full implementation, operational system. Goals have been achieved. phase project that will allow future improvements by connecting more business partners</td>
<td>6.3, 6.4</td>
</tr>
<tr>
<td>7</td>
<td>Feeder transport: EDI pre-announcement of cargo</td>
<td>Fully implemented system. Ready for utilisation in other ports and for EDI with other lines Successful installation. Ready for installation in other ports. Seedling for Baltic port security system</td>
<td>7.1, 7.1b</td>
</tr>
</tbody>
</table>

*) Deliverables that cover the cases’ results, evaluation and dissemination

Table 2: Status of the technical BALTICOM case studies

In conclusion it can be stated that the BALTICOM cases have all led to useful background findings which are generally reported in the x.1 deliverables of the respective work-packages. All results, with the exception of the chain management software of WP5 can be considered “ready-for-serial products” or they have indeed been put into regular service already. The software may have been customised for a specific case but they are significantly independent for use in other organisations (e.g. the dangerous cargo visualisation system for the Port of Stockholm.

All implementations have been reported as successful. Timing has sometimes been critical, like in the EDI link case with the Port of Stockholm and regarding the customs procedures between Finland and Germany. This is indicative of the fact that implementations just take
longer than originally expected and that both research projects and commercial implementations have to allow for sufficient time.

### 3.2.2 Intermodal transport

#### 3.2.2.1 The Cases

The general objectives of Work Package 4 were:

- „to come to a better integration of regional, national and international transport flows including various modes of transport"
- to introduce new technologies in freight transport by ensuring tracking and tracing of containers without any gaps
- to overcome incompatibilities in Eastern and Western systems
- to give a stronger impetus on environmentally friendly modes of transport“

Benefits expected from the work were to extend control over entire logistics chains at any time and to achieve enhanced transport reliability, safety and overall quality. Three distinct cases were chosen to test the ambitious goals:

- Transport chain exporter and seaport forwarder
- Dangerous goods
- Customs procedures

The system functionality aspect can be read about in deliverable 4.3, while the “Effects on Users and Clients” have been investigated in deliverable 4.4. While those documents should be consulted for details, the broad lines of the implementations are as follows:

- A steel manufacturer in Finland ships merchandise via its own port. The case dealt with in BALTICOM concerns smaller shipments, which are consolidated in Finland, carried to Hamburg and there they are decomposed into the individual shipments for onward transport. Stevedoring and transport are organised and partly carried out by a Hamburg based forwarder which is linked to the DAKOSY port community network. The soft spot was the fax transmission of cargo and onward-carriage data to the forwarder. In BALTICOM the fax transmission was replaced by an integrated EDI system utilising the DAKOSY network
• IT support for the transport of dangerous cargo is considered to be beneficial with respect to transport security and the reduction of negative environmental impact. Both EU regulations and a European funded project (PROTECT with a participation of north-west European ports) have led to considerable efforts to improve the situations on sea and in ports. The Port of Hamburg has been instrumental in this work and since 1997 all dangerous cargo has to be announced via EDI and is processed in the city owned and DAKOSY operated GEGIS system. BALTICOM strove to implement a similar structure for BSR transports. One of the challenges was to account for the different procedures and legislative backgrounds in the participating countries. Also communication between the different existing EDP systems had to be realised.

• BALTICOM analysed the transport chains across the Baltic Sea and identified the customs procedures to be a major obstacle for transports from and to Finland. The existing workflow from Finland to Hamburg was scrutinised in detail. Delays occur when customs in Hamburg request a physical “container announcement list” to be presented. The project sought to identify remedies in co-operation with the customs authorities involved and utilising the Hamburg based EDP system ZAPP, operated by DAKOSY. The project managed to bring together the authorities of both countries and to trigger a phased remedy action. At the time this report was written an understanding between the Finnish and the German customs in Hamburg had been achieved. All legal and procedural questions had been addressed and a new workflow designed. Further clarifications between the local customs and the governing body in Berlin had to be undertaken.

3.2.2.2 The conclusions

In the export chain implementation a successful EDI link has been established between the exporter in Finland and DAKOSY in Hamburg. The forwarder in Hamburg and its business partners are linked to DAKOSY. One new link (exporter to port community system) thus enables a large improvement of business to business communication. EDIFACT messages relating to pre-shipping, transport and post-shipping information are processed. The choice of “IFTxxx” messages ensures maximum standardisation level, thus a good portability of the solution is achieved.

Above and beyond the expected reduction of errors (20% of the orders were erroneous or difficult to read) and savings in working time the following effects were measured:

• A pre-shipping advice improves planning of resources etc.
In general more time can be spent for the planning of transports

Transports become more transparent

In the particular case BALTICOM helped to save the business for the forwarder as the exporter demanded an EDIFACT implementation, which would have been to difficult and expensive for the small company to implement. BALTICOM managed to lift the level of competitiveness of the forwarder so that it could manage its role in a complex logistics chain.

The most important findings beyond the particular case are:

- Large customers (shippers) require logistics partners (forwarders) to either accept paper input (primarily fax) or to subscribe to customer’s choice of technology. Such customers are unlikely to reimburse their partners for related effort, the implementation thus have to bear sufficient saving potential for the forwarder

- EDI data transmission and the relating process automation provides the basis for improvements of transport planning and execution. This results not only in commercial benefits but may eventually lead to a reduction in unnecessary transport (e.g. empty legging) and a better utilisation of public and commercial infrastructure (e.g. roads, floor space and terminal equipment)

- Port community systems provide the technical, managerial and business background to implement EDI systems. While they are normally successful in linking the majority of directly port related companies they are traditionally weak when it comes to hinterland companies. BALTICOM has shown a way ahead by supporting a port related company to establish an EDI link with a hinterland company

- Linking only one additional exporter or importer in the hinterland may have very significant multiplication effects. The company may communicate with additional partners in the same and in other ports. Likewise the resident logistics partner has been enabled to also communicate with other hinterland partners

- A success factor is the usage of standardised communication and messages. In transport EDIFACT has the largest user base. In the particular BALTICOM case the forwarder is also using a forwarder software tailor-made to operate with the local port community system. This additional level of de-facto standardisation may also be of benefit for further implementations

The dangerous cargo pilot of BALTICOM deals with significant differences between Finland and Germany, or to be more precise, Hamburg. While in Finland a unified port community system exists, each German port of significance has its own. Also the way the
HAZMAT directive of the European Union is implemented differs. In particular the Hamburg based GEGIS system already has an EDI link with the German competent authority for HAZMAT.

BALTICOM has come to an organisational and technical solution with test files having been exchanged so far. The core idea is to acquire the data electronically once only and to transmit it for the benefit of the shipping companies and liner agents across the different port community systems while satisfying the respective national HAZMAT requirements.

GEGIS is the mandatory system for the reporting of any hazardous cargo destined for Hamburg. The BALTICOM implementation allows Finnish customers to use their familiar national Port@Net system instead of reporting directly to GEGIS. The advantages are:

- In Hamburg the system is well established and uses EDIFACT messages. In Finland the port community system is just emerging and favours XML. The BALTICOM link allows Finnish users to stay with the technology chosen for Finland while satisfying the German legislative requirements.

- The port community systems in both countries satisfy the requirements and protect the investments of their local user base while enabling the necessary international communication.

- Both technical borders (different EDI philosophies and implementations) and varying legal requirements and organisational solutions (centralised vs. decentralised HAZMAT implementation) are bridged without burdening the users with unnecessary details.

For the benefit of efficiency and safety it would be useful to implement the solution found in BALTICOM. It would also be recommendable to extend the solution to other countries in the Baltic region.

Regarding the customs procedures the project was of course not able to solve the apparent problem with its own resources but needed to involve the competent authorities from Finland and Germany. The problem has an administrative source and a technological component. The administrative problem exists because the status of goods (intra- or extra community) is not clearly identifiable for the customs in Hamburg when goods come in from Finland. Customs in Hamburg require timely information so that no delays occur when goods are already cleared for extra-community traffic in Finland.

The project helped to identify the nature of the problem, to convince the authorities that it is indeed an important subject to consider and started tackling it. Three different remedies were developed and discussed. It is interesting to see that the readiness to find a solution
combined with the capabilities of the Finnish port@net system and Hamburg’s ZAPP system produced distinct possibilities.

The solution proposed by the BALTICOM project was composed in a close co-operation with the users. Without the unique user interaction the solution would probably not be as widely accepted as it is today. It seems that

- German customs
- Finnish customs
- Main feeder operators
- Main deep sea carriers
- Main terminal operators

can agree with the proposed processes outlined for transitional and for final stage. The proposed processes are focused on the customs data but the same process is feasible for the data flow concerning the dangerous goods.

The customs part of the case now needs some further work but is well under way with a two-phase implementation scheme. This particular pilot shows how much time is required when commercial, technical and administrative matters are intertwined. Participants of the project stated that without the engagement and status of the BALTICOM project the customs related problem would still not be tackled.

### 3.2.3 Logistics systems in raw material cargo

#### 3.2.3.1 Waterborne transport to promote export of forestry products

The case titled "Logistics Systems in Raw Material Cargo" (WP 5) deals with integrated and flexible transportation chains for forestry products between Germany and the Baltic states.

Forestry products are a domestic economic potential of the Baltic states. They represent a potential for sustainable economic development. The Baltic states have the same geographical conditions for forestry as Scandinavian and could thus build up the same powerful industry, but production and export volumes are small.

The domestic forestry products of the Baltic states are primarily transported via road to western Europe. However, local interviews and research showed that the multimodal
transport with maritime traffic is quite competitive to the trucking industry. The prices and the duration of transport are nearly the same, but waterborne transport is at a disadvantage due to bad transparency of what is happening along the transport chain, procedural problems in the ports and complicated documentation demands. However, with rising product value, also forest products will be containerised and thus easier to handle in an intermodal chain. This will increase the competitiveness of waterborne transport provided the information and organisational problems will be solved.

It is argued that in the future road and rail networks linking west and east Europe will lack the necessary capacity and quality required in modern logistics. The large number of expected land transports would require an immense effort considering the legal and organisational obstacles which are evident today.

Illustration 2: Northern transport tangent for the economic development of the Baltic states and Russia

Using waterborne transport implies to also use other modes. This means that integrated transport concepts must be developed providing efficient interfaces between transportation means, organisations and authorities. Computer based communication and information systems must be used to provide the necessary management and business support.
Computer based information systems in transportation chains have several advantages:

- Increased management options through tracking and tracing and improved quality control of own services and those of subcontractors
- Outsourcing of transport services, but staying in control of logistics performance
- Increased production-to-order orientation and better transparency of market demand and supply

### 3.2.3.2 Assessing port potentials

BALTICOM has carried out a detailed mapping of problems mainly related to export flows through ports from Klaipeda to Tallinn, with an emphasis on Lithuania. The investigation focused on the procedures and regulations governing border crossing transport and clearly demonstrates that improvements in this sector are at least as urgent as investments in infrastructure and handling equipment. The problems are not only related to East European administrative insufficiencies but also to discrepancies between East and West European regulations regarding for example hazardous goods and the securing of cargo.

It is stated that

- All Baltic states ports have different port procedures. Examples and tables can be found in chapter 6 of the investigation report. Especially the border procedures to Belarus are very mysterious, which is a major obstacle to transit traffic
- Partially, high technology port equipment is available, e.g. the container terminal in Klaipeda. However, the utilisation is low because of missing cargo
- The railways’ share of the hinterland transport is high. The transport quality and reliability with Russian wagons is bad
- Truck drivers experience the port and the safety procedures as complicated and annoying (e.g. double customs clearance in Germany and Baltic states, weighing of trucks etc.)
- Private companies in the Baltic states have good access to modern IT-equipment. It is sometimes better than in German companies
- Nearly all private companies in the transportation field have an internet connection which is used for data exchange between companies (primarily e-mail) but not to authorities. EDIFACT plays no role
• IT-use by authorities does practically not exist
• Dangerous cargo information systems do not exist

3.2.3.3 Introducing the transport corridor concept

The case study in workpackage 5 proposes the transport corridor concept as a practical way of solving administrative problems basically involving only the parties mainly concerned. The idea is to make special agreements for corridors containing certain ports and border crossings together with the authorities on site. All parties (private and public) from the different countries should jointly try to find practical solutions to common problems within international and national regulatory frameworks. The most important issue is to create mutual trust between the authorities and understanding and insight in the procedures applied. Experience from, for example Estonia and Finland, shows that it is possible also in practice to find a common way of interpreting the different regulations and facilitate the procedures to the benefit of all parties involved.

Some movement in this direction for the waterborne links between Germany and Lithuania is reported in the case study. Apparently there are practical as well as administrative and economic obstacles to use the inland waterways from Kiel (Kiel Canal) and Lübeck as links to Hamburg. The high German piloting charge in the Kiel Canal is mentioned as a barrier for inland waterways ships to use this link.

3.2.3.4 Use of IT for intermodal transport management

In the East Baltic ports from Sankt-Petersburg to Kaliningrad (Sankt-Petersburg, Tallinn, Riga, Ventspils, Liepaja, Klaipeda, Kaliningrad and other, smaller, ports) a process is now under way to create and implement information systems. Most ports use local information systems, which cover just Port Authorities and Stevedoring or Port Service companies. However, until now there are no complex port management information systems as found in many Western European ports.

The majority of companies use individual PCs and have local computer networks. A survey carried out within WP 5 indicates a high use of internet among the private companies related to the port (basically e-mail), while the authorities seem to be little prepared for the internet age.
The future development of the ports’ information systems depends to a significant extent on the implementation of modern data processing systems and EDI connectivity. International data exchange, e.g. using EDIFACT messages is now being implemented in some East Baltic ports, like Riga, Klaipeda and others. A first step, which is now in progress in the biggest part of the East Baltic ports – is the establishment of a common data base, accessible to all port users. The proposed data base shall be provided with information from most of the ports users involved. The data input shall be available to an extent necessary for relevant business.

According to Klaipeda’s port master plan the data bank system should include four–five stevedoring companies, about 12 ship agencies, approximately 10 forwarding companies, the Lithuanian railway company, Lithuanian customs, Lithuanian immigration office, Klaipeda State Sea Port Authority and other companies and institutions.

The data bank is to be operated on a commercial basis and is to be limited to multilateral information exchange relevant for cargoes and ship’s dispatching. Data security for the concrete users will be assured. Investment costs for the creation of data bank and information systems in all is estimated to 0,8 – 1,2 million EURO.

However, information handling within a port is different from information access and exchange in a specific transport chain. Given the observed need for improved information access and management among the partners in such chains, WP 5 also contains a design and development of a Transportation Chain Information System – TCIS. TCIS deals primarily with the so called operational data within a transportation chain supporting all companies involved. The concept of the system is to provide a central data base which can be accessed to certain extents by all parties in the specific transport chain.
The technical compatibility of TCIS revolves around modern and innovative internet technology. The access to the system is rather simple, whereas, no special software is required. All that is required is a cost-free internet browser. The information management is now centralised allowing all partners – if so desired - to have the same level of knowledge at the same time. Through different access concepts the function of the data base can be, according to special requirements, blocked or accessible.

The heart of the system, the TCIS data base, can be implemented within each company involved. However, in practice the cargo owner and/or the organiser of the logistics system usually want to have exclusive control of the information handled. They may thus also want to control the data base system. The data base is remotely operated via the internet, therefore only one Internet Server is required. The implementation is royalty free as it is based on Linux software. As a feature the SSL (secure socket layer) extension was implemented. The TCIS is in the pilot stage and can now be adjusted to concrete transportation chains.
3.2.3.5 Conclusions

The investments necessary to implement IT solutions need to be broken down into costs for software, hardware, and manpower to install the system. These costs can be calculated with a reasonable degree of accuracy. It is much more difficult to calculate - or better: predict - the time and money necessary to agree with the IT partners on the changes of business processes and on a lot of details, such as coded, data formats, etc.

The authorities are in some cases reluctant to work with modern IT technology, namely the internet. It is important to involve the authorities from the very beginning of a project if it covers e.g. customs procedures. It is also vital that authorities commit to use and maintain data in any agreed data repository to keep it comprehensive and up-to-date. The customs case of the export pilot Finland - Germany is a showcase for the role of a European project: The status, participants’ qualification and stamina of the project allowed to tackle a customs procedure problem which would otherwise not have been tackled, perhaps for years to come.

EDI implementation may be accelerated if combined with internet technology. That way EDIFACT messages and related communication technology - which may be conceived as both complicated and expensive - can be substituted. However, large scale implementations will for the foreseeable future rely on EDIFACT. XML messages and internet communication should not be looked upon as the universal remedy. The choice of messages and communication technology is important but represent just one of the many steps of a successful implementation.

Today XML implementations are usually sub-sets of EDIFACT messages. This simplifies the structure of messages and their interpretation. There is, however, a risk that different parties, countries, and industries interpret one and the same message in different ways without providing the safeguards of EDIFACT.

Through voluntary work further EDI transport messages are currently designed, implemented and tested. It is thus not necessary for anyone interested in using EDI to re-invent the wheel. useful and usable messages and implementation guidelines help to lower the threshold for smaller enterprises to make use of Electronic Data Interchange. It is thus more important to identify useful cases. Such cases should promise a tangible commercial or security benefit, it should be beneficial for all potential participants, and it should make use of existing technology, wherever possible.
3.2.4 Hinterland rail connection – the POLZUG case

This case specifies an EDI system for a train service between the ports of Bremerhaven/Hamburg and Poland and beyond against the background of the development of Polish foreign trade. Its stronghold is the support of competitive rail services in favour of road transport.

The port of Hamburg is a major hub for Polish trade 131,000 TEU to and from Poland were handled in the port of Hamburg in 1997. 44,000 of these were feeder transport and the rest road (50,000) and rail (37,000). The total container exchange by rail over the Polish borders were 103,000 TEU in 1997. It is estimated that Polish trade will continue to grow as the Polish economy grows with more than four per cent annually.

This case describes an improvement of the communication of information for an important transport relation for the port of Hamburg and how the port community through DAKOSY supports the development of an information infrastructure between all parties involved. The EDP systems used for the purpose are HABIS, WADIS, and ACTION.

3.2.4.1 A fully functional EDI-system for improving intermodal transport

The objective of the activities in this case (WP 6) was to specify and partly implement an information system which makes use of the railways more efficient. The system shall provide electronic data interchange between the train operator’s headquarters, terminals and business partners. The aim is to improve performance of rolling-stock and terminals, but also to increase the quality of the transport product offered to the clients.

The system provides the basis for establishing e-business in the B2B sector through exchanging information between the POLZUG terminals in Hamburg and in Poland and the DAKOSY information hub in Hamburg. The latter providing interconnectivity to the business partners (e.g. railways PKP and DB and truckers).

3.2.4.2 Priority to information exchange with POLZUG head office

The system is implemented in two phases. The first phase for the POLZUG Hamburg office and the main terminal in Pruszkow includes the use of new software for interfacing with an information node managed by DAKOSY, which gives access to the different
information systems used by the ports of Bremen and Hamburg as well as the railway operators. Phase one for the other offices of POLZUG is limited to developing the use of e-mail and the integration of this information in the in-house systems. Phase two focuses on providing the offices and depots outside Hamburg with software for yard control, railwagon status including maintenance and position information.

**Illustration 4: The role of UNIKAT (“Universal Interface for Communication with all Participants in Transport“)**

UNIKAT is meant to become a local communication node, which helps rail operators (e.g. POLZUG) to establish in an easy way links to the highly sophisticated and integrated communication networks in the German seaports. UNIKAT provides the possibility of online access and automated data exchange. It also offers interfaces to existing EDP-systems operated by the German railways (HABIS for Hamburg port, WADIS for Bremerhaven port). Other links included in UNIKAT are to other modes such as trucks, feeder ships, and other rail operators.
3.2.4.3 Correct information in advance - improved service and better planning

With the help of UNIKAT and other interfaces, electronic data exchange has been made possible between POLZUG’s in-house system and the Port of Hamburg communications environment via DAKOSY and between POLZUG and its subsidiaries in Poland. In doing so it is now possible to exchange electronic messages, based on formatted data transfer, in a machine-to-machine manner. The interfaces now created avoid double typing into two different systems. Before, POLZUG staff had to enter transport data first into the in-house system and second into the DAKOSY/HABIS system – data contents and structure being nearly identical. Now, data are automatically processed from one system to another. Time consuming double-operations and erroneous inputs have been minimised.

Several messages have been designed to exchange transport relevant data between POLZUG’s in-house system and Port of Hamburg communications environment via DAKOSY and between POLZUG and its subsidiaries in Poland. The messages, which can have identical or different contents serve several purposes. In general they accelerate all relevant information processes. All data are available in advance of the physical transport and are automatically checked, considerably improving data reliability and data security.

Data availability at each location of the intermodal transport chain allows to improve pre-planning activities and the distribution of dedicated information to all parties involved: terminal operators in Hamburg / Bremerhaven and Poland, customs in both countries, clients and consignees and the participating railway companies.

The print screen below gives an example of the interfaces and messages designed. Substantial effort has been made to create a user-friendly system able to handle all the detailed information needed.
Assigning containers to wagons

Capacity constraints are automatically recorded

Prepare loading sequence “Soll-Ladeliste”

Illustration 5: Screenshot from the POLZUG application

3.2.4.4 Practical results improving competitiveness of a combined transport chain

The BALTICOM WP 6 Hinterland Rail Connection demonstrates that the project results and achievements have a direct impact on the business and operative environment and on the operative processes of the user POLZUG GmbH and its clients. Improved efficiency and productivity of a medium-sized multimodal transport operator through the introduction of telecommunication support has been demonstrated.

The system designed contributes to an improved service quality in combined transport in the North German ports’ hinterland, which extends deep into eastern Europe and includes the most important EU accession country, Poland. The project contributes to an improved competitiveness of combined transport in a transport relation with fierce competition from all modes. These results have been achieved through the following technical developments:
The creation of electronic interfaces from POLZUG’s in-house EDP and EDI systems to the Port of Hamburg’s data communications system

The creation of interfaces to submit formatted messages from Hamburg to Poland to receive data in advance of the physical transportation

The implementation of a terminal software package at the terminal in Pruszkow to optimise all depot functions.

The new system has resulted in a substantial reduction of time needed for data input (from 5 hrs a day to 1.5-2 hrs). However, some additional time was needed during the introduction for training and for double checking the performance of the new system in order to create confidence. The new system is operational and promises to improve job assignment and job satisfaction, although it still needs some manual intervention. Abolishing manual typing has reduced the number of mistakes, but error messages and error handling procedures and support function must be improved. This will take place during the coming phase where a fully automated system will be developed and all the relevant staff will be trained.

The investments were mainly in software and adapting the in-house systems to the new system. It has partly been financed through BALTICOM and DAKOSY. POLZUG pays a regular fee for using the system and the DAKOSY support.

3.2.4.5 Improving combined transport in the INTERREG II B perspective

Further developments to improve intermodal transports based on sophisticated information and communication applications are necessary and the POLZUG case shows how this can be done. The most urgent solutions have been realised. The achievements under the BALTICOM projects serve as a good background for further transfer and diffusion of innovation of telecommunication applications in the transport sector into the Baltic Sea Region. Over time, spatial patterns could be influenced positively and negative effects on the environment associated to transportation could be reduced.

Within the context of the INTERREG IIB objectives, the project contributions can be described in a five-fold manner:

- It contributes to a sustainable transport chain by improving the environment-friendly combined transport mode
• It contributes to trans-national co-operation between private and public operators

• It contributes to the cohesion between Western Europe and Baltic Sea Region through an improved transportation link

• It contributes to the innovation diffusion of modern telecommunication applications, and finally

• It contributes to a strengthening of the hinterland of North German sea ports on an important port related transport corridor

The successful project is a good example for the positive allocation of financial assistance from public EU and local authorities. The financial assistance can be considered as an incentive for further private sector-driven autonomous system development. Furthermore, the pilot project Hinterland Rail Connection under BALTICOM contributes to the international and regional spread of combined transport technologies in a dynamically transforming spatial, economical and political context.

With respect to space and environment, the block train project of POLZUG adds value to the inter-regional network and communications by increasing the efficiency and productivity of the whole West-East transport chain. It contributes to the integration between seaport, region and hinterland and additionally contributes to an improved cohesion between Western and Eastern/Central Europe.

3.2.5 Feeder Transport

3.2.5.1 The case

From the perspective of a major seaport with limited Local Consumption ("LoCo") feeder transport is vital. It distributes and collects deep sea cargo from and to regions within its reach. Having said so, feeder traffic is also problematic: In the context of a large container terminal feeders are dwarfed by the large overseas vessels, they cause an over-proportional administrative effort and additional infrastructure and superstructure considerations. Also, the services are often provided by smaller lines which may have limited electronic data processing capabilities, in particular when it comes to electronic data interchange.

Other than Gothenburg no other Swedish port is served by overseas container vessels. Therefore feeder traffic is of vital importance to the domestic industry; the same is true for
all Baltic countries. Despite the new fixed crossings the majority of containers is carried on ships across the Baltic sea.

Based on the interest shared by Baltic countries and the Port of Hamburg BALTICOM investigated possibilities to improve the data communication between a feeder dependent port in Sweden and Hamburg. As opposed to other BALTICOM trials in which the respective national or local port community systems are engaged it showed that it would be useful to implement direct EDI connections. The Port of Stockholm runs its own EDP system, also the port is fairly small and solely operated by one company. Therefore there is no need for an extra port community system. For the Hamburg based feeder line Team Lines there was also no incentive to use the local port community system. This BALTICOM implementation thus adds peer-to-peer communication to the project.

The problem that was tackled by BALTICOM regards the pre-announcement of cargo. Conventional communication via fax required the port to enter data manually into its EDP system, causing unsatisfactory work, delays, and errors. In short: A standard problem encountered (but also caused) by many business partners. Although there is fairly little container traffic in the Port of Stockholm the resulting extra work to rectify mistakes and to deploy extra work force in case of late arriving data was significant.

3.2.5.2 Conclusions

The implementation of electronic cargo pre-announcement (bills of lading) makes good use of the existing EDI capabilities of the line and the port, with limited adaptation work to both EDP systems being required. The choice of EDIFACT for the messages and e-mail for the transmission is relatively simple and cost-effective.

As with most initial EDI connections, the set-up time, debugging and the agreement on data content took longer than expected. In this implementation BALTICOM experienced one of the big hurdles for the introduction of EDI: Electronic data exchange requires exact agreements on business processes and strict adherence to them. Once in place and turned over to regular service EDI usually works effortlessly and to the satisfaction of the parties involved, providing commercial, social (less tedious work) and safety benefits, as there is often hazardous cargo involved. Also the initial implementation makes it much easier to install follow-up applications, in particular with the same business partner.
Although EDI systems have been implemented for more than 15 years there is still a lot to do. Administrations wishing to support the competitiveness of their local and regional ports and businesses are still advised to support the introduction of EDI. The BALTICOM implementation e.g. will allow the Port of Stockholm to further improve the data connections with Team Lines. In a second step connections with other lines and port related business will be established. One of the important future moves will be improved information exchange with land side carriers. Thus timely information about the status of cargo discharge will reduce waiting times and allow better use of transport facilities. Although clearly the Port of Stockholm has quite a way to go to achieve such a high degree of information and customer/partner integration the small BALTICOM seedling is paving the way both technically and managerially to eventually get there.

3.2.6 Visualization of the locations of dangerous goods in the Port of Stockholm

3.2.6.1 The case

This pilot project aimed at providing the authorities responsible for security in the port of Stockholm with graphic information relative to the locations and movements of the dangerous goods stored in the port. The implementation was to be added to the already successfully operating port information system PortIt

For the sake of this report the aspect of technology transfer in an international co-operation is perhaps the most important one and it will thus be a focus of this chapter.

DAKOSY has designed a visualisation module along with its dangerous cargo implementation GEGIS for the Port of Hamburg. The system allows the user to identify the physical location of any item of dangerous cargo declared to the system on a graphical display with a large range of resolution and comfortable functionality. As the system has been designed for the Port of Hamburg it is meant to support a large geographical area and a high number of items of cargo. Various ways of accessing the data are required to identify potential hazards in case of a calamity and for preventive actions.

The aim of the implementation was to apply the rather large system from Hamburg in another and also a much smaller port, requiring the following considerations:

- To achieve an economical system the hardware, software and licensing costs have to be limited; existing hardware and software should be utilised as much as possible
• The local users have to be able to adopt to the system in a reasonable time; any functionality implemented in Hamburg but not required in Stockholm should not make the usage complicated
• The user interface need to be in local language

Illustration 6: Zoom function of the dangerous cargo system

The system uses browser technology which is also the familiar user interface for the PortIt application used in the Port of Stockholm. The user can zoom in on the area of interest, which is illustrated above.
Illustration 7: Localisation of dangerous cargo

The system is implemented on the server of the Port of Stockholm, while the user has a familiar web browser to work with. For efficiency reason the geographical maps are already downloaded to the workstations.
4 Embedding innovative technological applications in the regional context

4.1 Regional situation in the context of the case studies

BALTICOM examined the regional situation and spatial interlacing in the Baltic Sea Region according to different aspects. The entire Baltic Sea Region was chosen as an observation subject for the existing commercial interlacing. In this connection quantitative aspects of the commercial relationships and the different port sizes and port specialisation concepts play an important role. The technical and regional case studies were focused on individual ports with their environment. Here the stage of development plays, first of all, an essential role. On the one hand the member states of EU are to be distinguished with high and comparably similar equipment of the infra- and superstructure. BALTICOM carried out more specific investigations to Finnish and German areas. On the other hand the Baltic Sea Region contains adjoining states which had been organized within a socialist framework. Problems of the transformation states are discussed based on the examples of the areas Gdansk/Gdynia, Klaipeda and the St Petersburg. In this way BALTICOM covers a great spectrum of possible regional situations in the Baltic Sea Region and is able to make representative statements on spatial planning.

4.1.1 Finland

The main objectives of the Finnish cases (WP 8) can be summarised as follows:

- To define the future role and potential development paths of medium sized ports such as Vaasa, Kotka and Hamina
- To give suggestions in order to improve information flows of the waterborne traffic between Finland and other ports in the BRD, especially in Hamburg
- To develop future plans for the ports and hinterlands in the spirit of sustainable development

The regional analysis reveals that important factors of future spatial development are a general process of regional restructuring, especially industrial change, and the political situation in Russia. The study of the port of Vaasa and its hinterland emphasises the dependency of medium-sized ports on a good connection to the railway system. Because of the dominance of north-south transport relation in Finland, due to historical reasons the political changes in Russia allow a new approach to improve East-West relation which
would offer new possibilities for medium-sized ports in the Western part of Finland and short-sea shipping to Sweden (Umea, Sundsvall). A necessary precondition to evaluate these opportunities is an integration of public and private actors of different levels to improve the co-operation within the transport chain. BALTICOM has given suggestions in relation to transports of saw mills in order to use container and bulk cargo via the port of Vaasa instead of using trucks and trailers via the ports of Southern Finland (WP8).

4.1.2 Poland and Lithuania

Since at least 10 years Central Europe is undergoing fundamental transformations which includes far reaching political, economic, social and environmental aspects. Two port regions, the Tri-City agglomeration of Gdansk, Gdynia and Sopot in Poland and Klaipeda in Lithuania have been incorporated into BALTICOM (WP11).

4.1.2.1 The Tri-City agglomeration of Gdansk, Gdynia and Sopot

The port region is the third biggest urbanised zone of Poland, located in it’s northern part, about 350 km north-west of Warsaw. The Tri-City is a quite typical linear polycentric (bicentric) agglomeration, with two economic and four services centres, concentrated along the main transportation line, going from south-east to north-west, and consist of several urban and rural suburban communes. The complex is inhabited by about one million people. The maritime transportation centre of Tri-City consist of two separate ports: Gdynia and Gdansk. Despite relatively close distance there is no real agglomeration of port transportation systems or co-operation and collaboration connecting both ports. Additionally, the port of Gdansk comprises of two spatially and functionally separated parts; the Inner and the Northern Port. The port of Gdynia is divided into two locations (eastern and western port) with specific features and development potential.

The development perspectives of Gdynia and Gdansk include immense investment projects inside and out of the port zone in both cities. Port development investments may be divided into the improvement of maritime mobility, inland connections and off-port activities, such as value adding, city development and others. While both of the ports try to improve their competitiveness within the BSR, their investment plan and activities can also considered as intraregional competition because of investments in the same market segment.
The Port of Gdansk maritime investments plans include greenfield constructions as well as improvements of land use productivity. Examples are:

- Greenfield construction of Deep-Sea Container Terminal with a total final handling capacity of about 500,000 TEU p.a.
- Construction of Europort – Grain and Fodder
- Liquid Chemical Product Terminal
- Rudoprot – Ore Terminal

Besides the improvement of maritime modality, the development plans also include the modernisation and supplementation of the Gdansk and agglomeration road system like the construction of a suspension bridge to connect the north and east bank ports with the main road to Warsaw and Katowice and the tunnel under the Port Channel will directly connect east and west bank ports.

The Port of Gdynia directly borders city districts on its south and north. This is a handicap for expansive development. In comparison to Gdansk and Szczecin, Gdynia has much less land at its disposal, but there still are land reserves. They are favourably located in close vicinity of the port and the city. These areas can be used for port-industry and city functions, and waterfront development. There are three main directions of further Port of Gdynia development:

- Revitalisation and modernisation of the old Eastern Port
- Development of the old railway shunting yard
- Development of Western Port greenfield area of ca. 45 ha for a destination ferry terminal

Additional development concerns the improvement of the hinterland accessibility. The investments are mainly financed by central and local government, but also in some case by the World Bank funds and other external resources.

Though ambitious projects exist, integrated regional strategies are lacking, especially those related to co-operation to establish an overall port development planning. This may be seen as surprising, considering that both of the port authorities are partly owned by the same body – the State Treasury, which evidently does not have a vision or / and enough control over the ports.
4.1.2.2 Klaipeda

Today Klaipeda is Lithuania’s gateway to the Baltic states concerning wheeled traffic, this means both: road- and rail-vehicles. Seaborne freight carriage in the Baltic Sea relies on RoRo-traffic to a much higher degree than it does in most other regions. From this background, it should be appropriate to further try and attract RoRo- and ferry operations sailing out of Klaipeda. Since even the largest ferries and RoRo vessels are much smaller than for instance bulk carriers or container ships, the accessibility of the port (like draught restrictions, etc.) will not be the key issue. Klaipeda is well off for a good turnaround time for scheduled ferry operations. Key factors like a well equipped berth / terminal and tailor-made procedures like customs clearance, passenger check in etc. are in a reasonable standard though complaints still exist, whereas checking cars and freight in and out is still a far too slow. Klaipeda has to face the problem that a lack of reliability maintaining turnaround times or accomplishing standards of service may spoil the advantages of a favourable geographic location. Further efforts are necessary to built up a reputation for quality which may be marketed across the shores of the Baltic.

When compared to another port in the region – in this case to Ventspils – it is obvious, that Klaipeda today does not nearly tranship the same amounts of bulk - and especially crude cargoes. Klaipeda today in the first place counts on RoRo and container traffic. The transhipment of this type of cargo is much more depending on the ups and downs of the local and national economies of its target and source markets. Since the eastern economies’ future is hard to predict, this means traffic volumes may be volatile and strategies to minimise that risk have to be developed.

In order to improve its position in competition with other Baltic Sea ports and in order to regain its function as a transit port, the masterplan proposes the following measures:

• improvement of the seaward approach to and from Klaipeda (i.e. dredging)
• creation of a dedicated container terminal with special handling facilities
• expansion of the RoRo/Ferry Terminal (most recently: a cruise terminal)
• expansion of the Bulk Cargo handling facilities
• modernisation of the crude oil terminal and erection of a new terminal for crude oil imports (Butinge)
• improvement of the railway connection
• acquisition of new equipment for cargo handling where needed.
The topics of the masterplan demonstrate that risks of a mono structured port with a focus on crude oil, bulk (grain) and military supplies are seen. Further on, the plan reflects the situation that Klaipeda is Lithuania’s only sea port. Supporting an universal port is in the countries’ very own interest.

To improve the quality of administration further, port operation and management, Klaipeda will have to match the quality and reliability standards offered by ports in the European Union. A special focus will be on the implementation of information technologies in the port. These might for instance include online tracking of containers, online booking of services and facilities etc. Port related businesses of various branches could eventually open up a network of services and establish a common gateway to market them.

Klaipeda City Municipality puts special emphasis on the integration of development of the port and of the city itself. They share not only a common infrastructure, like motorways, engineering or other human resources, but shall also establish a common image of quality, when it comes to attracting investors for port related activities, tourists etc.

### 4.1.3 Impact of Vessel Traffic Information in the Finnish Gulf

VTMIS systems offer a network of connecting systems and services, where the exchange of vessel traffic information is essential. Applications using this information can be found in the field of vessel traffic services (VTS) and the provision of allied services. The original idea for VTMIS development was mainly focussed on connecting VTSs and the development of regional information services. However, vessel traffic information can also be useful for other parties involved in maritime/intermodal transport as for example managers of logistic chains.

The general functional requirements for a VTMIS can be summarised as follows:

- ETA information to the next port of call.
- Dynamic information regarding the ship’s status.
- Information with respect to dangerous goods and MARPOL annexes

The VTMIS-case study carried out in WP 10 of BALTICOM focused on the Finnish Gulf where Russian efforts to develop the port capacity will result in a rapid increase of traffic in an area with difficult nautical conditions involving three countries.
4.1.3.1 The Russian ports in the Finnish Gulf

The ports in the St. Petersburg region and in the Baltic States are experiencing immense transformation processes. The complete transport and logistic flow in the former Soviet Union has completely changed in recent years and the ports are trying to adjust to these rapid and far reaching developments to maintain and increase their competitiveness through a range of measures:

- Nautical conditions – approach, VTS, dredging
- Hinterland transport connections – rail, road, combined transport and pipelines
- Information and communication – electronic data processing, information and communication

This process is promoted by private enterprises as well as by public bodies. There are several Russian private enterprises aiming at controlling complete logistic chains and therefore compete for ownership of complete ports or single terminals.

The new Russian ports in the Finnish Gulf are estimated to increase the sea traffic in the Baltic Sea by more than 45% corresponding to 90 millions tons of cargo per year. The goods transhipment in the Russian part of the Gulf is expected to double till 2004/2005. Half of the goods handled are mineral oil and oil products: 8 mill. tons to be handled in St. Petersburg and additional 12 mill. tons in Primorsk.

Among the most significant investment projects of St. Petersburg and the “Leningrad Oblast”, i.e. the district around the city of St. Petersburg are the three new ports under construction:

- A complex of ports in Ust-Luga mainly for grain and container handling (as a replacement for the grain terminal in the port of Muuga and the container terminal in the port of Riga) but also including terminals for coal, ore, fertilisers, timber and general cargo – the annual capacity is planned to be 40 million tons. The seaport in Ust-Luga is located 110 km from St. Petersburg with water basins free of ice practically all year round. The channel is going to allow ships with a dead weight of 150.000 t. In the future a free trade zone will be arranged.
• Port of **Primorsk** with terminals for oil export as a potential replacement for the port of Ventspils and simultaneously the Baltic Pipeline Oil System connecting Timano-Pechersky oil field and North-West region – up to 47 million tons annually planned.

• Port in **Batareynaya** bay for handling of oil and chemical products (building started in June 1997) – 17 million tons annually planned, including a pipeline Kirishi for 12 million tons annually.

• High speed railway St. Petersburg – Moscow.

Also the port of St. Petersburg is improved:

• Strengthening of vessel traffic safety, purchase of new equipment and the introduction of the electronic chart of vessels’ arrangement in real time condition.

• Creating a container terminal of 150,000 TEU annual capacity at wharf 101. The first part has already been put into operation.

**Environmental situation**

The Gulf of Finland is surrounded by the coasts of Russia, Finland and Estonia. The main port of the region is St. Petersburg. The sea port of St. Petersburg is the largest transportation hub in the North-West of Russia and is located on the islands at the mouth of the river Neva in the eastern extremity of the Finnish Gulf. The port is connected to the sea by the Seaway channel with a length of 27 miles, the width of the navigable part varies between 100 m and 160 m at the bottom. The river Neva connects the inland waterway system with the sea.

The Gulf is scattered with islands and shallows at close distances to ship routes. Essential features of this part of the Baltic Sea are stormy winds, fog and rainfall in autumn, the snowfall and ice in winter. Environmental vulnerability of the region is increased through a nuclear electric power station (NEPS) in Sosnovyy Bor town (100 km from St. Petersburg) situated close to the main fairway. There is some fear that possible oil spills may cause technical problems for the cooling water system.
4.1.3.2 Information exchange in the Finnish Gulf

Port of St. Petersburg case

The BALTICOM case study centred mainly on issues involving safe maritime navigation. Ships arriving must give a minimum of 24 hours notice and those departing 12 hours. A 24 hour plan is prepared by staff at the port VTS centre Raskat (Illustration 8) and released to outstations and other interested parties at 15:00 each day.

Illustration 8: St. Petersburg Port VTS

Currently the only real-time link is with the Maritime Administration, with the remaining organisations being informed by fax. The distribution of the plan can take up to 2 hours and updates are made by telephone/fax. The Maritime Administration installed a Web server at the beginning of 1998 but, so far in the St Petersburg area, only the port VTS is connected to it. However, there are plans to put the daily movement plan on the server.

The port is under surveillance by radar and CCTV (Closed Circuit TeleVision) and a new VTS system has been set to work during 1998. The approach channel is under surveillance...
by three radars from VTS Raskat. This station provides navigation assistance to all vessels between the sea buoy and the port entrance. It also provides assistance to river traffic in 25 nm of shallower channels in the port approaches. Plans exist to establish a VTS with larger coverage, to seaward of the port approaches. Approval in principle has also been given by the Maritime Administration to explore the formation of a VTMIS for the Gulf of Finland, which will involve co-operation with Finland and Estonia.

All vessels entering St Petersburg are required to carry a pilot. No consideration is currently being given to exercising shore-based pilotage. Navigation assistance currently depends upon radar positioning but experiments with DGPS (Differential Global Positioning System) have been taking place since February 1998 and ships with appropriate receivers can already receive the corrections. The system is expected to become operational in the next few months. In common with other nations, Russia is waiting for the implementation of an IMO (International Maritime Organisation) carriage requirement for AIS (Automatic Identification System) transponders.

There is a willingness, by those operating the systems to release data but commercial and confidentiality issues require decision by the appropriate higher authority. Data relevant to ships leaving St. Petersburg for specific ports could eventually be made available provided a written request, specifying exactly what is required. Although the commercial value of the available information is recognised it seems to be accepted that this aspect of VTMIS would probably only grow slowly.

The port runs a comprehensive database, which amongst other aspects has a connection to the department responsible for billing visiting ships. Each segment of a ship’s passage from sea buoy to her berth is individually recorded. The database is used by the control system that is used to co-ordinate both sea and river traffic, including the opening of bridges. The system also co-ordinates the operation of ice breakers and the formation of convoys.

**Regional case**

According to recent information (September 2000) the Russian Ministry of Transport has decided to expand the VTS-monitoring from the St. Petersburg area to the whole Russian part of the Finnish Gulf. The reason is the rapid growth of traffic density and size of ships which increases the risk of ship casualties in the Gulf and the Baltic Sea with potentially disastrous consequences for the environment. The aim of the VTS of St. Petersburg and the
new Regional VTS is to enlarge the service area and create an open information system architecture possible to integrate with European community structures (Illustration 9).

Illustration 9: Planned Regional Vessel Traffic System (RVTS)

**Cross-border case**

The Finnish VTS system is based on a combination of VHF, radar, computers and TV monitoring. Presently there are two VTS centres, one in Helsinki and another one at Nauvo in the Archipelago Sea. Helsinki VTS will expand the VTS area during year 2000. Two more VTSs will be established; one in the Gulf of Bothnia (covering the area Kaskinen-Tornio) and the other in the eastern part of the Gulf of Finland. Kotka VTS is expected to be ready by the end of 2000, Hanko VTS is estimated to be operational 2003 – 2004.

The traffic between Helsinki and Tallinn is about 28 vessels per day and Helsinki and Tallinn VTS are both interested in co-operation, but no time table has been fixed. Information collected by the two VTS systems should be exchanged electronically. The same kind of co-operation is planned to take place between Helsinki-Kotka and Helsinki-Hamina. Turku VTS is also considering a co-operation with the Swedish VTS world.
4.1.3.3 Using VTMIS

The main beneficiaries of the proposed VTMIS system are the VTS operators (coastal and port VTS), Port Authorities and ship masters. In addition there are public bodies on regional and national levels as well as commercial undertakings which are able to benefit by reducing their operational expenses or by improving services to the clients or by providing a value added service to their clients. Within VTMIS several individual actors could be co-operating (Table 3).

<table>
<thead>
<tr>
<th>Existing and possible private and public VTMIS actors</th>
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<tbody>
<tr>
<td>SAR</td>
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<td>Pollution</td>
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<td>Agents/Ship</td>
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<tr>
<td>Tugs</td>
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<td>Icebreakers</td>
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<td>Mooring Service</td>
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</table>

Table 3: Existing and possible private and public VTMIS actors

The proposed functions for VTMIS, the users and the related information is summarised in the following table:

**Main functions:**
Casualty reporting, Waste disposal reporting
Agent/Ship and Port reporting
Ship reporting
PSC (Port State Control) Inspectorate in one Member State to PSC Inspectorate in another member state reporting.

**The main users involved are:**
Agent/Ship company; Ship movements;
Results from experiences with several previous VTMIS demonstrators indicate the following advantages:

- Communication possibilities between existing systems are improved at the same time as the need is reduced
- Improved access to traffic information for traffic and transport operations management
- Easier and faster access to vessel and cargo data
- Improved contingency planning
- Dissemination of marine pollution information
- Use of traffic images, for example in SAR (Search and Rescue) operations.

The VTMIS advantages translate into organisational and socio-economic effects.

<table>
<thead>
<tr>
<th>Improved organisational effects</th>
<th>Improved socio-economic effects</th>
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</thead>
<tbody>
<tr>
<td>Better quality of information.</td>
<td>Increased vessel traffic efficiency</td>
</tr>
<tr>
<td>Improved planning of resources destination port.</td>
<td>Increased efficiency of the port and other services</td>
</tr>
<tr>
<td>Improved service quality level</td>
<td>Increased safety of maritime operations</td>
</tr>
<tr>
<td>Reduction of ship masters’ workload</td>
<td>Improved working conditions for waterborne resource management operators</td>
</tr>
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Table 5: Organisational and socio-economic effects of VTMIS

4.1.3.4 Spatial development and regional impact

In the long run VTMIS will support the optimisation of goods flow and have a positive (regional) influence by means of a (regional) resource management and risk control
provided that the actors involved are willing to co-operate. Thus, VTMIS can have certain regional impacts, such as:

- Less maritime accidents results in decreasing environmental pollution
- Minimised consequences in case of accidents through timely and specific counter measures
- Better use of waterborne, road and rail transport resources through improved management information
- More efficient use of land resources in the ports because of improved efficiency of transport processes
- Decreasing environmental load in ports and hinterland because of less traffic congestions.

Conclusions and recommendations

The case study carried out BALTICOM concludes on the following recommendations for further development of VTMIS in the Baltic:

- Disseminate the principles of VTMIS more effectively over the user groups so that these groups better understands the principles.
- Establish a demonstrator of VTMIS based on the needs of a user group that agrees on information to be exchanged and the procedures which are required and the selection of a competent authority.
- Review all requirements of possible users for a VTMIS (including those of calamity fighting and SAR at sea) and develop a VTMIS, providing all traffic management information to any user based on regional traffic images.
- Give priority to vessel movements and associated safety, efficiency and environmental aspects. Issues related to shore based logistics and transport management should be excluded as there presently is little interest from cargo owners to use VTMIS as an additional source of information

4.2 Port Regions in Northern Germany
4.2.1 General aspects

The economical relationships between Germany and the other EU-states of the Baltic Sea Region are very intensive and stable although there is a small decline in volume since the end of the nineties. The relationships towards non-EU States of the Baltic Sea Region are not homogenous. Whereas there have been growing exchange activities with Poland, the commercial interlacing with other states of transformation including Russia is still low.

The modal split of German exports to the BSR has been estimated by the OECD and analysed in WP 3. The main transport media of the German export to the BSR is the ship with a share of over 70%. But there are regional differences concerning the exports: The train is dominant with a share of more than 50% of the export volume to Poland. Vessels and trucks have a joint share of about 20%. In the trade with Denmark the trucks dominate with 50%, followed by the vessels with 30% and the rail with a share of 15%. Vessels transport dominates primarily the German exports to Norway, Sweden and Finland as well as to the three Baltic states.

The most important German ports for exports to the BSR are Lübeck-Travemünde and Rostock, followed by Hamburg, Sassnitz-Mukran, Kiel and Bremerhaven. There are certain regional specialisations: Lübeck-Travemünde and the ports in Mecklenburg-Vorpommern are most important for Sweden, the trade with Norway dominates at Kiel. In Hamburg there is no obvious regional specialisation regarding the trade with certain BSR countries.

4.2.2 Hamburg

Hamburg is by far the far largest German sea port and acts simultaneously as an agent of transport links to destinations overseas and as a main port to the supply of the areas in the BSR. The role of the port as the most important transportation node in northern Europe is undisputed and Hamburg will keep this function also in foreseeable future. This position presupposes a high capability of the material infrastructure and its logistic integration through IT in respect to quantitative magnitude, efficiency and turnover rate. In general, Hamburg is investing regularly to improve port related facilities to meet new inquiries of changing transport chains and logistical necessities. Examples are:

- completion of the new Container Terminal Altenwerder
- enlargement of Eurogate Terminals
reconstruction of old parts of the port for container handling

• enlargement and construction of a new urban waterfront (Hafencity)

• combined container terminals between Hamburg and Lübeck managed by HHLA

The IT infrastructure in the Port of Hamburg is well developed based on pioneering efforts which took place in order to co-ordinate and integrate information through EDI systems almost 20 years ago. The IT systems are kept u-to date. Actors involved in IT are also involved in R&D-programmes of the European Union and other funding bodies in order to harmonise administrative issues and solve IO-problems for intermodal issues and different actors. IT support for port related activities has gradually developed to a value-added service within the region. Though there is no research about quantitative figures concerning turnover, employment and innovation rates this industry may be seen as a promising field of knowledge based economy.

Modern port related economic development is characterized by tendencies of decentralisation (evolution of port networks, compare WP9) which implies that port functions may be translocated outside the port area itself. Nevertheless, Hamburg will remain a physical node in future because of its relative location within the context of central European and Scandinavian transport flows. Ports within the BSR are connected by feeder transport which highlights the transshipment function of Hamburg. The penetration of the European inland continent is realised by the well-developed block train services and to a lesser extent by inland waterway container service by barges along the Elbe river.

From a spatial planning perspective to support sustainable transport modes it is a primary task to improve transports by vessel and train in view of the existing modal split and the recent growth of road traffic. This recommendation points to the discussion about an improvement of short sea shipment which has to be improved within the existing intermodal competition.

4.3 Port related technological changes and their effects on spatial planning

Basically ports affect spatial planning locally through their own spatial development and regionally by their functions to other locales, e.g. other ports and the hinterland. Port related technological changes in general and IT in particular depend on types, intensities and complexities of theses function which differ along the dimensions import, export and transit on the one hand and in relation to main commodity segments bulk, unitised cargoes and passenger. Basically import and export bulk sector relates to some local or regional
industry and therefore employment. Transshipment in bulk has local implications through storage areas only. Unitised cargoes link a port to a locality through terminals and warehouse space. Furtheron there is a constant request for favourable hinterland connections. Moreover spaces are needed for distribution and collection of goods. Passenger ports link to a locale through the land-based traffic they generate especially in the port and adjoining urban area. However with respect to IT ferry / RoRo and container port functions are most important. From a VASAB point of view these port markets are of utmost interest, too, since they regard competitiveness with road and rail sector.

In the Baltic Sea Region technology change has different faces. In the eastern parts and in most of the western parts technology change meant the construction of a new terminal or the buying of specific terminal utilities, yet not necessarily investments in IT. Moreover the introduction of IT has to do with volume of transports as well. As was shown in respective workpackages these are very concentrated (WP 3 and 8)\(^2\). So that early innovators would concentrate on a few locales, only. So technology change in the Baltic Sea Region very much has to do with classical infrastructural measures. With respect to BALTICOM project this applies to Klaipeda and Gdansk case in particular, where new terminals were constructed and/or are under construction (WP 3.2)\(^3\). Both investments clearly help achieve VASABs goals of consolidating each of these ports universal functionality. Moreover all these actions show progress in respect of VASABs aim of strengthening the competitiveness of vessel traffic and thus enhancing intermodal transport.

Theoretically modern technologies can dilute importance of port locations (like driverless hinterland depot connections), others can help solve specific location related problems (like SPEEDPORT) and third ones could help support decentralised port structures even in container business (FASTSHIP). This latter aspect relates to VASAB directly in that it takes up the aspect of enhancing national and international coastal traffic between a large number of smaller ports that are complementary to a few universal ports.

\(^2\) Compare Workpackage 3.2. and 8.

\(^3\) Compare Workpackage 11.1. and 3.2.
In the context of BALTICOM Vessel Traffic Information Systems proved significant and important for locales as well as all stretches in between\(^4\). They affect the safeguarding of business, seamen and the environment. A great demand for VTIS in Baltic Sea Region and due to new port projects for Finnish gulf in particular is shown in WP 10.

To summarise: Most of IT in ports relates to terminals and the optimisation of their functions. Furthermore physical dimension as well as spatial implications are only local. Effects on a broader scale and regional implications could result from increasing efficiency of terminal operation and thus of an attraction of additional transport chain operators. However, all these issues come already into play when decisions about terminal locations have already been made.

In relation to the scale of the Baltic Sea Region informational links creating networks of interaction play a crucial role because of the high concentration of feeder traffic operators. A port’s position in such a network is fairly weak because of its spatial immobility. However, a good strategic location in container transport - including established business connections - is very unlikely to diminish from one day to the other. Hinterland connections, however, are fragile - so improvements of inter-regional relations are of utmost importance. Therefore, the competitiveness of a port depends also on regional political actors’ ability in putting those inter-regional political institutions together to effect these hinterland connections. A good example are co-operations in customer service between different states as it has been shown in WP 5 and in WP 6.

Lastly a port’s fit in a region can be looked at institutionally, too. Location of ports in different regulative spaces can cause a problem of regional integration, too. This was investigated in and shown by the relation of Finnish regions to Hamburg. Although both countries are members of the EU problems occurred regarding technicalities of customs procedures. Moreover this problem was linked to IT as well. Major ports of Finland have established a common national interface to trading partners via the software port@net. Since customs is of concern to all these ports the solution of technical customs problems can be implemented for all ports via the software. This way focused negotiating in combination with interregional co-operation of ports could bring about immediate improvements to all regions. Within the Balticom project and in relation to VASAB the

\(^4\) Compare Workpackage 8.
port city of Oulu’s integration into the network of Baltic Cities was thus enhanced. And with that its hinterland can profit from these improvements, too.

4.4 Recommendations for spatial planning.

4.4.1 General guidelines within the context of the BSR

According to European Spatial Development Perspective the concept of subsidiarity is at the very heart of European understanding of spatial planning. Therefore locational problems are problems that should be solved on local level. But, regarding the ports, transport chains play a crucial role. In this context, it has to be recognised that globalisation in general and the fall of the iron curtain have enabled companies in particular to outsource activities and to geographically restructure inward and outward oriented flows of commodities. Therefore issues of spatial planning in ports do have a local and international component. Recommendations have to cope with different scales in an integrated way.

As a matter of this the ports’ immobility in this network summarises the crux of their position: They need to function within the transport chain. Chain operators can switch locales if they do not do. At the same time infrastructure and superstructure investments get more and more expensive. Whereas superstructure investments are a private obligation in most European countries infrastructure investments are a public task. However, finance is a shared responsibility of different spatial scales of government including municipalities and interregional bodies. An important function of spatial planning is to avoid inefficient use of finance. To fulfil this issue information about infrastructural investments and investment plans have to be recorded and dissipated between ports within the BSR. Furtheron spatial planning should start an institutionalised dialogue with port business for reasons of mutual information exchange and planning security in both directions. As a bottom-up process these positions could then be communicated on the next level of problem solving with respective actors from other nations and or the political field within transport (rail and road).

As regards information technology some aspects touch transnational issues. Most evidently the aspect of standardisation which is an issue at the very heart of business. Though there exist already bodies of private and public actors who work in this area, the hitherto presented solutions are not satisfying. One mayor problem is the integration of private
companies in processes which look for general solutions. In this field BALTICOM has demonstrated first promising steps.

However, there do exist issues of common Baltic Sea Regional interest. On a smaller level for instance there exists a good example of a regional co-operation between ports and governmental bodies. This is the case of port@net in Finland where this public-private partnership constructed a common international interface thus enabling enhancements in the system to affect all regions (regional integration) at the same time. It is very likely that more of these issues exist, particularly in other countries. Spatial planning should seek contact with port business to find issues of inter-port cooperation.

As shown on the case of VTIS there exists are great demand and many benefits for it in the whole Baltic Sea Region. A number of ship wreckages during the last half year in other areas have once again shown the importance of such systems for the human environment. Therefore spatial planning should urgently organize dialogues between responsible personnel to coordinate transnational application. Moreover concepts like FASTSHIP could be the basis for spatial planning backed incentives of usage in order to help establish decentralised port network. Yet this could be an issue of sub-European level, too.

### 4.4.2 Framework for regional action

As it has been analysed in the previous chapters it would be inadequate to recommend „one best way“ for spatial planning within the context of port related interaction in general and in BSR in particular. The main reasons to be careful with strong recommendations may be summarised as follows:

a) The spatiality of port activities has evolved from clearly delimited port areas to functional port regions and to port networks more recently. The functional interdependencies, creating the network, may consist on sequential relations (output of one node is the input for another, e.g. relation between port and inland container depot), reciprocal relations (actors are using each others output) and pooled relations (use of common resources). The term network suggests that these interdependencies may not be territorial and that modern port related activities have a strong tendency towards decentralisation.

b) The trend of a spatial decentralisation of port related transport chains is accompanied by attempts of the main actors involved to achieve control over the segments of the chains
(D3.3). Though it is not clear whether one actor will be the most influential one in the future, the entrepreneurial strategies are not predictable in relation to their spatial outcome. But it is rather obvious that the crucial factor within the transport chain will be the customer orientation while the transport space will be organized as flexible as possible. This interpretation supports decentralized hub and spoke concepts with „footless“ or shifting nodes. Based on some standardized norms the question of appropriate IT support will depend on the dominant position of an actor within the transport chain. Or to put it in other words: the inventions and early adaption of new IT depends on the necessities to optimise integrated transport and logistics chains and the economic power of private actor constellations.

Following these lines of argumentation the existing ports have to deal with territorial decentralisation of port related activities and tendencies of economic centralization of private actors involved. Therefore the frames of independent action become more and more narrow. In more general terms, existing ports do not only have to create and sustain competitive infrastructure including IT but have to be prepared to offer far reaching services for foreign trade, transport and communication in order to be able to react as flexible as possible to new challenges. Beside an effective node of physical interchange, successful ports will become learning regions for transport and communication offering systemic knowledge for integrated transport and logistics chains.

This strategy is open only for existing main ports and those medium-sized ports able to promote a certain specialisation because it presupposes very high investments and probably only indirect returns on welfare and employment. Small and the majority of medium-sized ports will function as possible nodes in future transport chains. This implies the latent danger that many ports try to invest in expensive infrastructure in order to compete with each other without being able to realize returns. A crucial element is finding a certain harmony between public investments in infra- and private engagement in the superstructure. Anyway, problems of public disinvestments are already on the agenda and there is a latent danger for continuous planning failures as the examples of Gdansk/Gdynia and Klaipeda illustrate. To reduce an overall port competition in this segment institutionalised forms of information and co-operation between private and public actors should be promoted in order to avoid unnecessary public investments and to improve power balance.

Faced with the imminent enlargement of the European Union and the integration of Poland as well as further states of the Baltic Sea Region a general strategy of the modernization of the maritime infrastructure is to be recommended including IT. The expected increases of
transport will not be manageable country-sided in spite of great infrastructure projects like Via Baltica. The expansion and improvement of sea-based mobility of goods and supporting infrastructures should be emphasized in initiatives of spatial planning within the Baltic Sea Region.
5 Conclusions and recommendations for transport and regional planning in the Baltic Sea Region

5.1 Competitiveness and co-operation

The main idea of BALTICOM was to show which impact new information technology (IT) in transport may have on services and facilities in ports and their hinterland and thereby on policies for regional spatial development in the BSR. A deeper understanding of these interrelationships contributes to the INTERREG II C and VASAB objectives of building an efficient and sustainable transport system by promoting intermodal transport solutions. Co-operation along the transport chain and between regions and ports in the BSR are expected to encourage such a development. BALTICOM, with its focus on waterborne transport and ports, confirms the need for interaction, but also shows that competition in the BSR between regions, ports, carriers, and shippers governs the options for co-operation and integration.

BALTICOM highlights how the notion of a transport corridor seen from the perspective of spatial planning is something different from a transport corridor seen from a commercial viewpoint. In the first case long term plans for public investment and land use provide a framework for economic activities while in the second case, short term objectives of satisfying transport market requirements are in focus, when identifying the corridor to be used. Market conditions, not spatial planning intentions, govern the transport route to be chosen. It follows, that from a commercial perspective, it is interesting to have access to a network of corridors offering a number of competing options, while in regional planning it is interesting to limit the need for public investments to corridors in order to focus the efforts of creating the necessary development conditions for the region.

In comparison with the networks for road, rail and waterborne transport, the ports are an interface, not only between land and sea modes, but also between private and public responsibilities. Primary road and rail networks as the major sea routes are generally a national, public responsibility, while the port must offer its facilities and services in competition with other ports under (at least partly) commercial conditions. The port must look beyond its own region in order to secure access to the necessary hinterland infrastructure and to encourage the required services on this network.

Thus, when considering port development (and thereby waterborne transport) in the context of spatial planning it is important to recognise that the viability of the port (defined as infrastructure and services) is also characterised by infrastructure conditions beyond its own region and by an attractive supply of handling and information services in the port.
itself and in operations outside the port. Hence, the “region” of a specific port is defined by physical as well as operational conditions and the "action field" necessary to consider for a port extends well beyond the administrative area in which it is located.

5.2 The user perspective in BALTICOM

It is hard to foresee the spatial consequences of the strategies of shippers and carriers. But it is rather obvious that customer orientation of terminals and carriers, of agents and their clients (the shippers) will be a crucial factor when determining a transport chain. Flexibility is needed in order to adapt to different needs now and in the future. The competitive position of a port are to a large extent given by its geographical situation; this is an obvious limitation of its options for a flexible response to a diversity of customer needs.

A port serving a huge market close by has other options than a port mainly serving transit traffic to and from markets far away. In the latter case, favourable sailing conditions and land side accesses are especially important to maintain and develop the traffic. However, this is not enough to secure the attractiveness of the port in a situation with competing modes and transport routes. It is necessary to engage the clients of the port and their customers when developing the port and its services. EU-guidelines to ensure fair competition between the modes and between the ports limit the conventional options to attract clients through subsidised services and new ways must be found to be competitive.

Technical development is attractive as long as it does not result in deterring costs for the users. Reduction of administrative costs of port related transactions is another way of increasing efficiency in the transport chains to the benefit of the users and the port itself and the investments needed are rapidly written off. BALTICOM shows several examples of the feasibility of such “facilitation activities”, where authorities from different countries are brought together with representatives of the ports and the transport industry to improve the situation in a specific transport relation.

With respect to the INTERREG intention to engage a wide spectrum of organisations in the BSR, an other lesson learned in BALTICOM is that concrete problem solving has to be offered if the transport industry shall find it worth while to participate. BALTICOM also shows that such a bottom-up approach opens interesting views on the institutional and the administrative framework and on spatial planning.
5.3 Responding to the goals

5.3.1 Economical, environmental and regional impact of modern information and communication technologies within maritime transport economy

5.3.1.1 IT is needed to stay competitive

The surveys and cases of BALTICOM illustrate that the ports in the BSR regard Information technology (IT) as an important means to meet the needs of their clients, but also as a measure to improve safety and efficiency of the internal operations in the port itself. However, port management information systems able to handle resource planning, cargo handling and administration in the port as well as information exchange with clients and authorities are only partly available in the small and medium ports in the EU countries of the BSR. Ports in the accession countries and Russia are planning to build systems which should support their role as information nodes in the logistics chain. Improved use of IT is evidently seen as a necessary means to meet customer needs and to stay competitive in comparison to other ports, but there are several obstacles to be overcome before a system is operational.

Increased use of IT has a technical dimension which of course has to be addressed, but the major obstacles seem to be related to the organisation of systems for information exchange between private organisations as well as between public administrations on different levels and in different countries. Such issues include responsibility allocation, principles for cost sharing and access rights, which could affect the competitive situation of the parties involved, their administrative role and their business models.

The BALTICOM cases show that small players in the transport chain, be they ports, carriers or agents/forwarders are often obliged to introduce electronic data interchange (EDI) by the dominating partners in the chain in order to stay in business. The co-operation and the technical assistance established through BALTICOM have supported such introductions technically, economically and organisationally. Although the results show that investment costs are rapidly written off and customer satisfaction increases, introducing EDI implies quite an effort for a small organisation. It is not merely a question of money, but also to be able to take time away from everyday operational tasks and to be able to develop the stricter working procedures required. But once the task is
accomplished, the efficiency is improved and more capacity becomes available, which could be used to manage more vessels or trucks or documents per person hour.

5.3.1.2 Internet changes IT architecture and organisation

Due to a more widespread use of internet and emerging standards, the conventional port community systems are changing into more open systems, eventually developing into future electronic market places. However, the port community still recognises the need for an “organising hand” which can support this development and facilitate the interface(s) to different administrative systems and provide services to promote a smooth information exchange within the community and between the community and the world outside.

IT-maturity and internet is now about to change the role and the organisation of port community systems. Ports considering to introduce such a concept should carefully consider the changed situation. A range of technical options for information and paperless document exchange are open today to the parties involved in taking cargo into or through a port without necessarily engaging in a formal co-operation or establishing a physical network. However, the ability to provide concrete support for the common objective to make the port including all its related services more efficient remains important. This development can be studied in all the North Range ports. DAKOSY in Hamburg, for example, has an increasingly important business role as a support for hinterland services developing EDI standard links with the port community in competition with other service providers. At the same time, the organisation facilitates and manages the administrative procedures related to customs and hazardous cargo regulations. The role of the city state of Hamburg is to act as a catalyst by promoting a common framework on which the parties involved in the port business can build their applications.

Internet opens new possibilities, but also present new challenges. It has a significant impact on present logistics due to its ability to make data and information exchange easier and more affordable. The next step is that internet will start affecting business collaboration. The network is about to become the market, not merely a means of communication. This development is predicted to make it possible and thus, also necessary, to engage in more complex relationships on an open global electronic market. It would entail complex processes of information exchange and value creation between partners. In spite of the present problems of many “dot.com” companies, it can be noted
how new constellations of otherwise competing service providers and purchase organisations engage in different types of co-operation on the electronic market.

BALTICOM concludes that IT use is still a somewhat virgin area for many players in transport in the BSR, but also that IT based services are needed for those wanting to stay competitive. The development outlined above stresses this conclusion and even indicates increased demands on rapid and effective adoption of the new information technologies. The e-commerce winners will be those that can offer more efficient solutions that impact both the buyer and seller of logistics services. For the buyer this translates to increased product velocity in the logistics pipeline, while reducing logistics costs. For the seller, it means dramatic improvement in logistic asset utilisation and improved transaction efficiencies.

However, the IT development also carries threats, especially for small organisations as they may have trouble in investing the necessary amount of time and money for equipping and reorganising their operation. As indicated above, a further development of new business methods based on internet implies an increased risk to be left behind the more powerful players. Such a development could eventually result in a concentration to and a domination of a few major players.

5.3.1.3 The economic impact of IT

More rapid and correct information, easy to handle automatically and to distribute evidently reduces transport costs and increases quality and customer satisfaction. The BALTICOM cases have shown the feasibility of the solutions implemented. However, the need for support for this process has also been illustrated. Lack of internal resources, technical uncertainties and the necessity to involve parties up- and downstream the transport chain make it difficult for a small organisation to engage in implementing IT-solutions, even if they in the end are beneficial to the organisation’s economic situation.

5.3.1.4 The regional impact of IT

Seen from a regional perspective, the BALTICOM results indicate that IT is an important means to maintain the competitiveness of the port and to establish the logistics services of the port as a part of efficient intermodal transport chains. With examples from BALTICOM it could also be argued that IT can help to reduce administrative problems, which at least in the ports of the East European accession countries seem to constitute a
major obstacle to efficient transport performance of the ports. However, experiences from BALTICOM also indicate that customs procedures and administration of hazardous cargo information in the EU ports of the BSR could be improved. This would help to explore the full potential of IT from an EU perspective and not merely use IT to map national procedures to adhere to EU regulations.

5.3.1.5 The environmental impact of IT

BALTICOM case studies show that better information management is considered a requirement in any intermodal transport chain setting out to compete with a door to door truck transport of high value cargo or as a part of a sophisticated logistics system. Evidently this is a very relevant requirement on waterborne transport in order to be able to compete in many market segments. However, involving waterborne transport does not automatically imply a more environmentally friendly transport solution. An old vessel, inefficiently used produces more emissions per ton transported than a modern, fully loaded truck.

The Baltic is a very sensitive natural environment where vessel traffic already constitutes a burden. Developing trade in the BSR will increase the impact in already critical areas as illustrated by the expansion of Russian ports. Better vessel management information facilities and organisations are needed in order to improve control and reduce risks. The BALTICOM study of the conditions in the Finnish Gulf points in this direction and so does the recent collision in Southern Baltic close to Denmark. Most of the necessary regulations are in place, technical solutions are available. Improvements depend on national consensus and organisational issues.

5.3.2 Developing sustainable transport facilities, chains and corridors within the BSR, especially with respect to the Eastern European countries

The enlargement of the EU develops the Baltic into a sea almost completely surrounded by EU member states. However, the economic situations in the present member states are quite different from the situation of the accession countries. The activities under INTERREG II C and VASAB 2010 shall help to merge these two Baltic sub-regions into the New Baltic Space in order to promote a sustainable development in the entire BSR.
The development of a sustainable transport network is considered as a powerful means to promote this goal. However, how it should be done is an open question.

As discussed earlier in this report, it is important to remember the market forces, even when discussing the development of sustainable transport solutions from a spatial planning perspective. The demand for freight transport services is generated and formulated by individual entrepreneurs and private companies, which operate on highly competitive markets. This obviously limits the possibilities to guide the development in a specific geographical area. It puts high demands on planning to be flexible and on the foresight of the planners. On the other hand, good public infrastructure, e.g. the road system, also helps to attract business and to improve efficiency.

An attractive and competitive port is often considered as a regional, if not a national objective supporting the economic development of the region or the nation. Traditionally, the consequence of this view was that the port operation and the related infrastructure was a public responsibility. Today, port operation is no more considered as a suitable or even acceptable task for public services. Some regions are starting to question the need for any public involvement in port business. Why should a city own a port? It does not own the marshalling yard or the truck freight terminal.

Such ideas do not mean that the city should not plan for or care for its port, only that it must distinguish between public and business objectives. Local political opinions, competition with neighbouring regions and lack of overview might induce the city or the region to invest too much in relation to a realistic assessment of the commercial outcome. The examples of Gdynia/Gdansk and Klaipeda seem to illustrate this risk.

Waterborne transport of high value goods needs to offer high frequency of regular services and stability over several years in order to be competitive to other modes and to really allow for the emergence of solid trade relations. A few well served ports also make it easier to focus national investments in the hinterland infrastructure, which normally can not be spread out to cater for too many alternatives. Competition between regions in this respect often delays the investment decisions. In addition, stable and big transport volumes also on land open for more attractive intermodal services.

In this context it might be worthwhile to question the benefit of transit traffic; through the port, the city or the region. The issue was raised in one of the Finnish cases in BALTICOM in relation to the Russian transit traffic, but is also valid elsewhere. Investment needs and environmental impacts have to be assessed in relation to job opportunities and other
revenues against an appraisal of the stability of the traffic. Transit transport might help to
develop new and highly needed services and skills, but it might also deviate resources
better used elsewhere and might create e.g. environmental damages difficult to repair.

5.3.3 Increasing transnational co-operation and the competitiveness of
companies in the Baltic Sea Region by pilot demonstrations

BALTICOM has shown through pilot demonstrations that co-operation between the parties
in a transport chain, between ports, regions and authorities can give concrete
improvements to everyday practical problems and thus contribute to the goals of cohesion
and economic development in the BSR. The results have been achieved in a highly
competitive environment and indicate that there are areas for co-operation which do not
distort competition, but promote a sustainable transport system to the benefit for the
society as well as the private players. Such areas are for example:

• Promotion of the use of IT among the port community and between the port and the
  world outside

  Introducing IT in the business process is a complex issue affecting internal and
  external procedures, core business ideas and market positions. Building efficient IT
  relations between authorities and private organisations requires special attention. E-
  business development suggests that internet will speed up the reorganisation of
  commercial relations and market behaviour. Apart from infrastructure, companies need
  some basic agreements on standards. The public sector on a national, regional or local
  level can act as a catalyst in this process.

• Co-operation between customs and other authorities in specific transport corridors

  Goodwill and mutual trust is a good basis for solving practical problems within an
  existing regulatory framework. Regional authorities along a transport corridor sector
  can together create the platform for such facilitation work. They can bring in all parties
  and moderate the work of creating a common understanding of the problem and
  hopefully also of finding a practical solution.

• Regional co-operation between public bodies and private companies in order to
  understand spatial needs based on the assessment of long term commercial trends for
  waterborne transport and other factors affecting future transport demand.
A port is acting and reacting on developments far beyond the region in which it is situated. Infrastructure investments in competing transport corridors have to be assessed as well as new commercial constellations and technical development. Spatial and economic planners have to understand the port needs and prospects in order to be able to assess the consequences for the region.

5.3.4 Implementing new networks between transport companies, scientific organisations and Baltic port cities

BALTICOM has shown how a development from physical handling of goods to managing of logistics systems creates a need for advanced services and related training and education facilities. The IT perspective chosen by the project only emphasises this development. A modern port can be characterised as an important node in a learning region, which in addition implies the need for co-operation with other, similar regions. What has been said earlier also indicates that there are other reasons for networking. A “market watch” in a wide sense is required not only by the commercial players, but also by other institutions in the region in order to be able to assess planning and investment needs. An other need for networking is generated by the many practical problems of becoming a true European Union. Knowledge, trust and common objectives across former borders can best be developed through co-operation around concrete problems.

5.4 Recommendations for actions

IT can contribute to a sustainable, intermodal, interoperable and interconnected transportation network within the Baltic Sea Region. A network which has positive effects on the competitiveness, cohesion and environment of a highly dynamic region on its way to be fully integrated into the Europe Union. Nevertheless, there is a need for further action on a macro-regional and political level, in regions and cities, in companies and authorities.

The need for harmonisation of general rules and regulations, procedures, conventions and even documents in cross-border (transport) operations is evident. The transformation process must be fostered through the creation of a uniform legal and regulative environment. In addition, the practical applications of such rules and regulations must be harmonised.
An other issue of sustainability with a cross border regulatory perspective is environmental monitoring in the Baltic. BALTICOM has highlighted the need for improved co-operation in vessel monitoring.

Improved data, which is easy to access would improve planning possibilities. A “BSR transport network monitoring system” would help planners across the Baltic. With the right type of data such a system would also be of use for business decisions and then also be commercially viable.

Ports and their (public) owners must clarify the assessment of their future role in the transport network of the BSR. What should be the development strategy when some ports become parts of the TEN and TINA networks and what would be the consequences for the other ports? In this context, it should be interesting to analyse a maritime transport corridor concept based on ferry services in relation to the transport networks constituted by other types of maritime transport. Different types of port organisation and the liberalisation of port related services might have an impact on the available range of solutions.

Regional authorities concerned with port development should strengthen their role as catalysts for facilitating transport handling and information exchange. An activity, which at the same time creates the network needed for assessing the future and developing the skills and services needed. The pressure increases on the small and medium ports to develop a full range of IT-services if they want to stay competitive and if they want to take market shares from the road sector. The lack of off-the shelf-systems and uncertainties about technical standards merit a co-ordinated effort to develop at least a common approach on how to handle the issue. An “IT master plan” supports the port community in helping itself and assists the port to define interfaces to different administrative systems.
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