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INFORMATION SYSTEM FOR THE GOODS TRANSPORT SERVICE NETWORK

ABSTRACT

Intermodal transport can reduce the load of the road infrastructure. Knowledge gives it the necessary competitiveness and helps to control its costs. Fast reaction to changing conditions, opportunities and requirements gives remarkable advantage. Setting up integrated logistic chains using alternative transport modes requires the trust and close interaction of a variety of actors involved in managing the chain. Especially in the dynamic mobile environment, knowledge has so far not been effectively used. FREIGHTWISE tackles this complexity by developing a framework architecture anchored and validated in a range of demonstration cases involving commercial and public actors. This paper discusses the general FREIGHTWISE objectives and its North-East Case, the Logistiikkainfo goods transport service network information system to be implemented for the Estonian – Finnish transport chain.

KEY WORDS

information system, transport, logistics, operators

1. INTRODUCTION

An important goal of the European Transport Policy [4] is to increase the share of intermodal transport as a means to make better use of existing transport capacities. FREIGHTWISE is an integrated project funded through the European Commission's 6th Framework Programme. The objectives of FREIGHTWISE contribute to promoting interoperability and the industry by providing good examples, practical methods and tools. This presentation gives some background to the project and its North-East Case.

Figure 1 visualises the complexity of the intermodal transport chain in relation to its competitor, direct door-to-door lorry transport. The figure indicates the FREIGHTWISE approach to developing an efficient management structure, which is considered necessary to make intermodal transport competitive.

There are many commercial, technical and organisational obstacles to overcome in combining various transport services to an efficient transport chain. Rapidly changing business and administrative requirements demand high level flexibility of the transport industry in terms of the services offered and the related management systems. Integrated transport management requires business integration and trust with a potential perspective of long term co-operation. Access to information and communication are key elements in this context. Business partners must communicate with each other and with the authorities. However, companies find the advanced IT-based management tools still expensive and difficult to use. Standards are too wide or inadequate and do not support the interaction of all parties involved.

2. THE NORTH-EAST CASE CONCEPT - LOGISTIIKKAINFO

The North-East Case of FREIGHTWISE focuses on co-ordination of the whole value chain and the related information chain of intermodal transport. The addressed problems are, for instance, vehicles that arrive early to ensure their connections and required service and having difficulties to find their way at unfamiliar terminals. Congestions at terminals or border crossings reflect on the connecting traffic network.
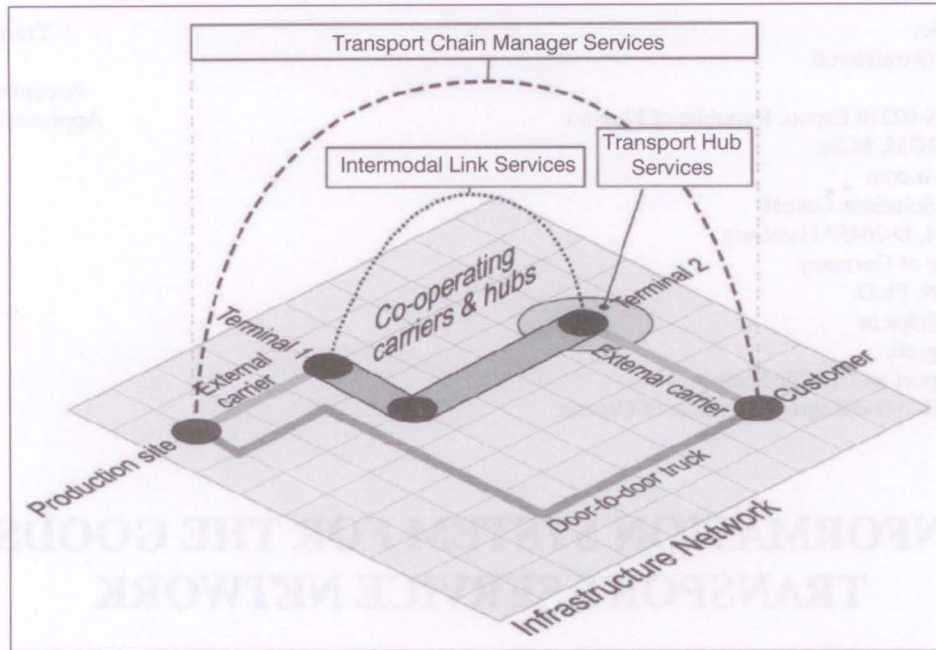
Figure 1 - Intermodal transport versus direct lorry transport

Tens of kilometres of lorry queues are a regular phenomenon. Instructions and signs for waiting areas are often inadequate. Drivers wait in their vehicles for an undefined time due to the lack of proper information. On the other hand, the transport network hubs may have no real-time location and arrival time information of the vehicles: forwarders and stevedores stand waiting for a delayed transport. Drivers without real--time information of the situation may also assume that they are late and thus take unnecessary risks on the road.

Various transport modes have their own dedicated management systems that enable them to manage and control their part of the value and transport chain. Some of these are integrated to enable transport co-ordination. However, a service that covers and integrates all stakeholders is missing. Such a service could effectively collect all available static and dynamic information in the value and transport chain (conditions, incidents, guidance, etc.) and deliver it to all actors based on their actual location and tailored to meet their personal needs.

The interactive data system of the North-East FREIGHTWISE Case was designed to optimise the value/transport chain operations and to help to solve the described problems. It increases the information flow between the carriers and their operational environment making use of advanced data collection, storage and delivery mechanisms. The involved data providers and users include the vehicles, the drivers, transport companies, bus companies, logistics companies, forwarders, terminals, ports, port operators, shipping companies, customs, roadside service providers, road administrations and other actors in the logistic chain.

Data from various sources are entered or imported from external decentralised databases to be used as
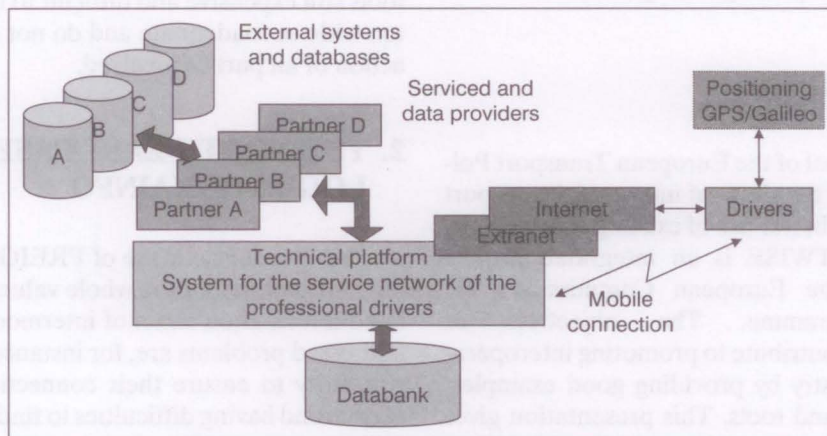

Figure 2 - Logistiikkainfo operational environment

the basic and default data. It is either by request or automatically distributed to all who need it. Changes in the default data trigger the information chain targeted to those whom the data concerns (and have registered as system users). When new data is entered or imported, the basic/default data is automatically updated. The fresh data is distributed targeted in different formats based on the interest profiles of the various stakeholders.

Each stakeholder draws his own conclusions and takes the required measures. Data of these actions are re-distributed to the actors concerned. All registered users receive a continuous update of information. The service is based simply on route information given by the carrier, the driver or the transport system but also location-based or driver-specific services will be available as soon as the GPS (and Galileo) equipment become more common.

On the simplest level the service makes use of GSM and thus serves also drivers without the latest devices. Even the expanded level service requires no specific devices. The more complex service versions can be used with existing and planned on-board units. Implementing the simplest versions is very easy and reasonably priced. The service is activated by calling a service number that offers all language versions and service alternatives (works also with foreign mobile connections). Logistiikkainfo provides a simple information chain with open interface technologies that supports and/or utilises the existing and planned systems. The interfaces are open so that all the needed systems and initiatives can be integrated with Logistiikkainfo.

One of the unique features of Logistiikkainfo is the possibility of third parties to communicate with the driver without knowing who he is or his telephone number. This feature is especially designed for harbours, border crossings and terminals but also the sender and receiver of the goods may utilise it. When, for instance, a harbour logs in to the system it sees all transports on the way there, their estimated schedules and order of arrival. The harbour may inform the chosen drivers about new time schedules, problems at the harbour or congestions. Thus the harbour may control the incoming traffic and even its work load and need of resources.

3. LOGISTIIKKAINFO IS A COMMERCIAL SERVICE

First contracts of integrating external service and data providers' systems and also with the first carrier clients were signed during the year 2006. Integration with the Traffic Information Platform of the Finnish Road Enterprise, FinnRE, was completed by the end of 2006. Logistiikkainfo has signed contracts with major Finnish producers of on-board units and software for logistics operators, for instance with Hand Held Systems that develops software for Psion and Itronix computers and with Scania Trucks for their on-board computers.

Other significant services of FinRE's platform are real-time traffic information and the Varo Alert service discussed already at ZIRP 2005. Varo Alert was commercially launched for professional drivers and carriers in January 2006. Figure 3 gives an overview of the Logistiikkainfo service data contents. You can study the Finnish Logistiikkainfo version at
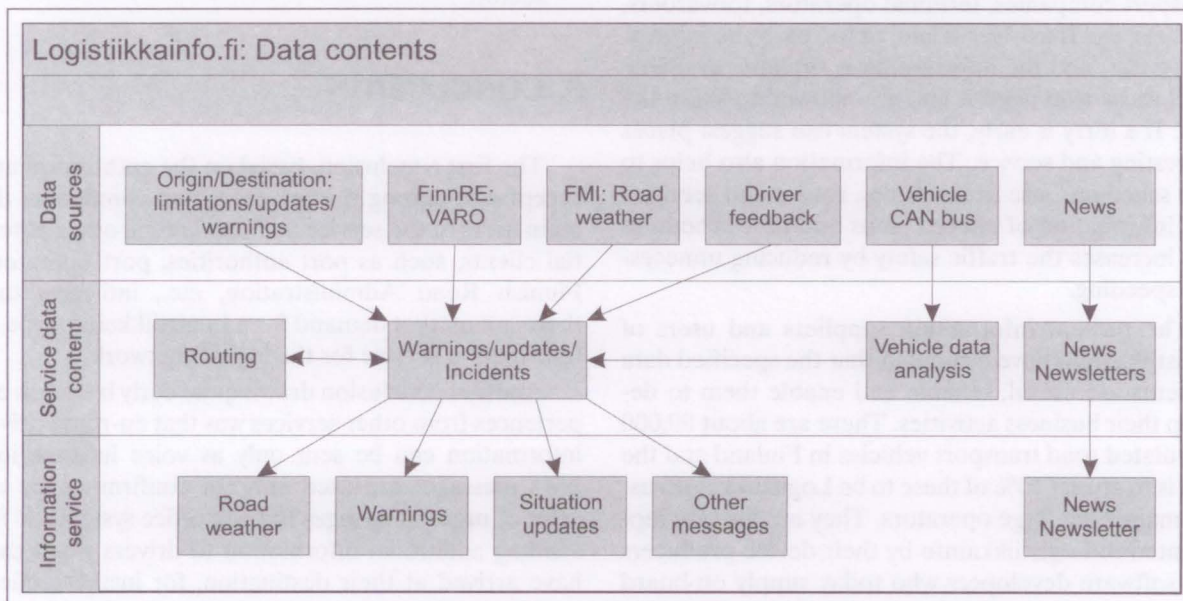
www.logistiikkainfo.fi.

Figure 3 - Logistiikkainfo data contents

In the framework of FREIGHTWISE Logistiikkainfo goes international. The service is set up and tested with traffic between Finland and Estonia and also on the border crossings between Finland and Russia and Estonia and Russia. The goal is to develop a Logistiikkainfo based cross-border transport network information system including sea links (Finland – Estonia), land transport links (Finland – Russia and Estonia – Russia) and terminal points where the goods are shifted from one transport mode to another.

Finnish border crossings have serious problems to manage the arriving traffic and avoid long queuing times. The average daily lorry traffic on the three southernmost border crossings sums up to over 1700 lorries. About half of these pass through one border crossing. During high season the volumes are multiple. The situation on the Estonian – Russian border is similar. The Road Administrations, Customs and Border Guards have projects that aim to manage traffic and ease the queuing on the border zones but no system for managing the arriving traffic flows. Logistiikkainfo is expected to bring a solution also to this problem.

4. EXPECTED IMPACTS OF LOGISTIIKKAINFO

The most important advantage of improved information provision is that it enables a new way to organise the activities. When a vessel is late, the information is automatically delivered to the port where it replaces the original time schedule. The updated data is then automatically delivered to all stakeholders: drivers, transport companies, terminal operators, forwarders, customs, etc. If a driver is late, or too early, he informs the system, and the information is similarly available to all those who need it and are allowed to share the data. If a lorry is early, the system can suggest places for resting and service. The information also helps to plan schedules, use of resources, routes and services. The information of altered plans and time schedules also increases the traffic safety by reducing unnecessary speeding.

The present information suppliers and users of Logistiikkainfo have evaluated that the specified data contents are useful, reliable and enable them to develop their business activities. There are about 80,000 articulated road transport vehicles in Finland and the goal is to attract 10% of these to be Logistiikkainfo users, mainly the large operators. They are already represented in Logistiikkainfo by their device producers and software developers who today supply on-board units to 50% of these 80,000 vehicles. Each carrier makes his own decision of subscribing to the service.

Also all main terminals, ports, forwarders, port operators, etc. are expected to join Logistiikkainfo.

Global goods suppliers (manufacturers, wholesalers, etc.) need global logistic service providers who can successfully integrate operative realization of deliveries, i. e. receiving of shipments and information flows not depending on geographic borders and the solution for that kind of approach is 4PL.

Fourth-party logistics (4PL) is a term coined by the global consulting firm , which registered it as their trademark. According to their definition, 4PL is an integrator that functionally assembles the resources, capabilities and technology of its own organization[1] and other organizations in order to design, build and run comprehensive supply chain solutions.

The 4PL concept is based on the intellectual logistic capital and IT systems, and not on the ownership of the infrastructure (terminals, warehouses, etc.) and other material assets (transport means, cargo handling machinery, etc.) which is why the 4PL operators use various 3PL providers to provide services to their customers. The role of 4PL therefore represents a unique integrating point of information flows and executive responsibility.

The 4PL competencies lie basically in the following three areas:

1. control and management of the work of several 3PL providers, both at the strategic and operative level;
2. control and management of know-how regarding availability and practical implementation of new achievements;
3. control and management of IT sector, with the emphasis on IT systems integration with the operative sector.

5. CONCLUSION

The first conclusion, based on the enthusiasm and acceptance among the project group comprising the main users of the service and also among other potential clients, such as port authorities, port operators, Finnish Road Administration, etc., indicates that there is a market demand for a Logistiikkainfo type of information service for the logistic network.

Another conclusion drawn quite early based on experiences from other services was that en-route driver information can be sent only as voice information. SMS messages are used only for confirming the receipt of urgent messages to back office systems or for sending additional information to drivers when they have arrived at their destination, for instance client numbers, reference codes and various identification codes.

An important advantage of improved information provision is that it enables a new way to organise the activities.

- the information helps to plan schedules, use resources, routes and services;
- when a vessel is late, the information is automatically delivered to the port where it replaces the original time schedule;
- the updated data is then automatically delivered to all stakeholders: drivers, transport companies, terminal operators, forwarders, customs, etc.;
- if a driver is late, or too early, he informs the system, and the information is equally available to all those who need it and are allowed to share the data;
- if a lorry is early, the system can suggest places for resting and service;
- the information of altered plans and time schedules also increases the traffic safety by reducing unnecessary speeding.

Logistiikkainfo was commercially launched at the end of 2006, when FinRE's part of the integration to their platform was completed. There are about 80,000 articulated road transport vehicles in Finland and the goal is to attract 10% of these to be Logistiikkainfo users, mainly large operators. They are already represented in Logistiikkainfo by their device producers and software developers who today supply on-board units to 50% of these 80,000 vehicles. Thus we cannot yet refer to primary results of user acceptance studies or even first feed-back from the users. However, we are convinced that Logistiikkainfo will be a success and meet the expectations of our enthusiastic partners.

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