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Real Time Traffic Information from Ferries to Optimise Intermodal Transport Chains

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Abstract

The baltic sea traffics are in particular characterized by ferry and RoRo traffic. Numerous ferry connections link the neighboring countries and thus allow for an exchange of goods. The use of real time information still has untapped potential so that the respective initial and terminal hauls as well as port-related transshipment processes can be matched to the ferry traffic as a major part of journey in multimodal transport chains. In this way, to provide dispatchers with decision-relevant real time information enables timely decision-making, not only with regard to efficient fleet management, but also with a view to a better customer service.

Schlagwörter/Keywords:
ferry traffic, Real Time Traffic Information, intermodal transport chain

1 Introduction

The transport system of the Baltic Sea depends on well-functioning ferry connections. In the Baltic Sea, ferries for passengers and freight represent bridges without alternative between individual regions. For example, numerous islands in Norway are connected via ferry lines of only a few kilometers. Moreover, ferry connections are used as an alternative to onshore transports. The Baltic Sea offers a wide network of cross-country routes, which can take a few hours to days. For both, passenger and freight, ferry connections are usually part of a multimodal transport chain. In order to increase the efficiency of these complex logistics systems, cross-company cooperation within the multimodal transport chains is imperative. The recording and provision of up-to-date information on punctuality, delays, disturbances or cancellations is necessary to precisely plan the transport modes of multimodal transport chains. So it is expected that a permanent monitoring of the arrival of the ferries in real time leads for example to lower waiting times and thus streamlined processes for logistics service providers (LDL) as well as to increased transparency and improves the customer satisfaction (Vojdani 2016, Vojdani & Uhlich 2019).

To date, the information-based ferry connection to land-based transport modes has had a clear deficit. In the maritime transport sector the potentials of real time information is hardly developed. Up to now only one project for the intermodal real time passenger information system has been carried out, the Rostock- Gedser travel chain (VVW 2015).

This article reports on the project "RTF - Using ferry real time information to optimise intermodal transport chains in the Baltic Sea Region" which fosters the utilization of ferry real time information to optimise intermodal transport chains for goods and people in the Baltic Sea Region. It explores which stakeholders from logistics can use ferry real time information to improve their own processes and to fine-tune the processes of other partners in multimodal transport chains and regarding the public transport make it possible for passengers to improve their journey planning. Within the framework of this contribution, benefits of real time information of ferries for the logistics sector will be presented.

2 Processes in the port

The operators of a multimodal transport chain with an integrated ferry service are represented by ferry operators, logistics providers and hauliers, port authorities, terminals for combined transportation (CT terminals), stevedoring companies, booking offices, train operators and optionally marshalling yards.

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The planning and execution of the port processes in the ferry terminal are initiated on the basis of the Scheduled Time of Arrival (STA). Stevedoring companies use the STA to plan the staff and the means of transport in order to avoid waiting times. In addition, the harbor office plans the deployment of the mooring services at the STA. The STA is also used for the deployment and capacity planning of logistics warehouses in ports.

Goods transportation by ferry can be accompanied or unaccompanied, that is, after passing a trailer gate, the truck travels with trailer onto the ferry or sets its trailer on predetermined parking lots to allow it to be transported to the ferry by stevedoring companies. The allocation of the trailers to corresponding parking spaces is made when booking the ferry transport and is determined by a port information system.

If trailers reach the port area by freight train, then CT terminals are responsible for the handling of the trailers on the port's parking spaces. The CT terminals carry out their import and export processes depending on the timetables of freight trains and ferries.

A marshalling yard can be connected to the CT terminals. Employees of the CT terminal transfer the information about cargo transported by the freight train into the port information system. The port information system serves as the interface between the stevedoring companies, the CT terminal, booking offices, ferry shipping companies and the port office. The booking office creates loading lists for the ships by means of booking information. These are sent to a stevedoring company, which transports the trailers onto the ferry.

For import processes, logistics service providers, hauliers or train operators use the schedules of the ferries for timely provision of trucks, drivers and wagons at the port terminal. In the accompanied transport, the truck driver accompanies the load and drives the truck out of the ferry or from the port. In the unaccompanied transport (RoRo traffic) the loading unit is not accompanied by a driver, hence the ship is unloaded by a stevedoring company providing the trailers on import parking lots, which are picked up by a logistics service provider and are forwarded. If transported by train, the CT terminal takes responsibility of the loading of the trailers on a freight train.

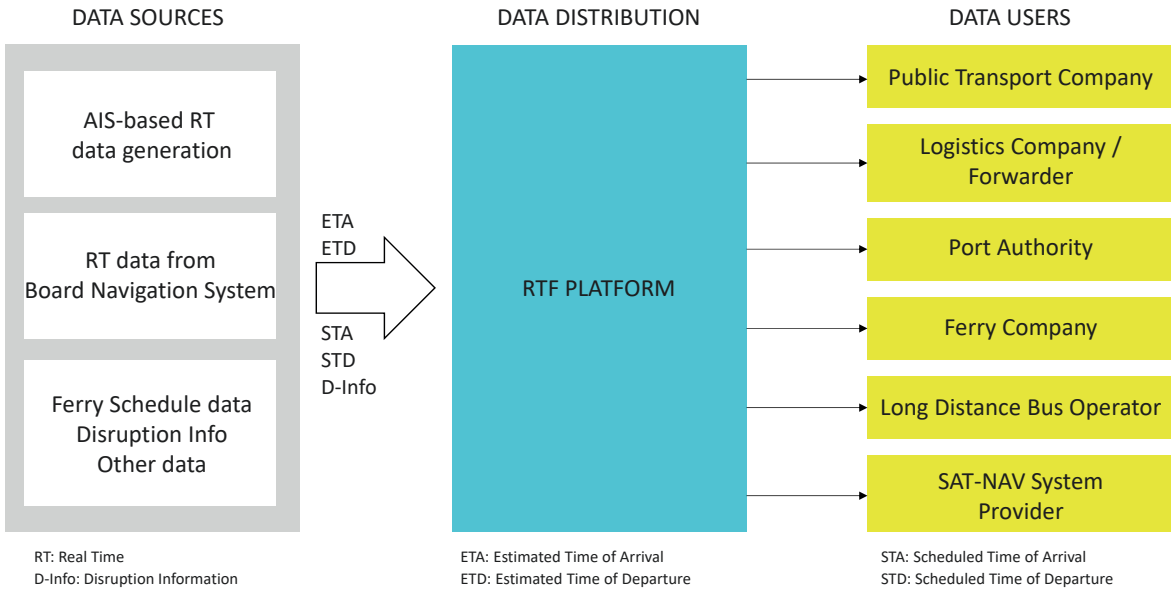
Ferry lines are operated with defined timetables (STA). The exact journey time of a ferry is dependent on numerous factors, such as the weather. In particular, long ferry connections are subject to major deviations of the ferry arrival time from the STA, which the actors of the transport chain have to take into account in their planning.

These factors can lead to deviations from the schedule. The captain shall notify the shipping company about any changes in the arrival time from the scheduled arrival time (STA) and shall forward the estimated time of arrival, the so-called ETA (Estimated Time of Arrival). The shipping company informs the parties concerned. The information is transmitted via e-mail, telephone or short messages and has the effect that the information reaches the actors with a delay and thus reduces the chances of a situation-based rescheduling.

3 Real time information in maritime transport chains

The aim of the RTF project is to develop a platform for real time ferry information to provide logistics and public transport companies with real time data. It will be tested by implementing several use cases related to logistics and public transport using selected ferry lines. This makes it possible for example, for the passengers to see for selected Baltic Sea

Figure 1: Real Time Information System – System Architecture, source: c.f. Vojdani & Uhlich 2019



ports appropriate public transport connections in case of a ferry delay and for the logistics companies for example, to get information about delay or cancellation of ferries.

The provision of the ferry real time data is ensured by different methods which are applicable to a wide variety of data sources, e.g. AIS (Automatic Identification System) and weather data.

On the one hand the ETA can be calculated with the help of forecasting procedures based on planned data, weather data and AIS data, and on the other hand by directly retrieving the data from the navigation system of the ferries and transmission to RTF Platform (Fig. 1) via web providers.

In order to actively use the determined real time ETA as well as the accompanying data, these must be loaded into a data hub and compared with the planned (scheduled) data of the respective ferry. In the future, RTF Platform participants involved in a maritime transport chain should be automatically informed about the ETA of the ferries and deviations from planned data in real time. The information transfer to the transport management system (TMS) of the logistics service providers e.g. takes place by using push notifications.

4 Potentials of real time information for logistics sector

The following potentials can be exploited by means of real time information about delays, disturbances or cancellations of ferry connections:

- stevedoring company is enabled to provide trailers to be transported synchronously on the parking lots in front of the incoming ship.
- Port Authorities use the real time information to better plan the mooring staff and allocation of berths.
- Train operators can, in coordination with the CT terminal, supply trains for the port at the right time in order to have the trailers on the wagons JIT-picked up from the stevedoring company.
- The integrated cooperation in export processes will lead to a reduction of the overall average laytime of the trailers on the parking spaces of the CT terminal.
- In terms of staff and capacity planning, as well as waiting times, the stevedoring companies were able to achieve positive effects.
- Logistics service providers are enabled to improve planning along the entire supply chain thanks to an early provision of information.
- A better service is provided by automatic and timely notification of the customer about the delivery status and the arrival times.
- Information about ETA will be provided and, if necessary, the re-routing of lorries on the way to the port will be initiated.
- An optimized allocation of waiting and traffic areas at the port can be achieved.
- Ferry capacities can be used alternatively in case of truck delays.

The following table summarises the benefits for some stakeholders of a maritime transport chain.

Table 1: Stakeholders with their respective benefits, source: c.f. Vojdani & Uhlich 2019

Stakeholder	Benefits
Logistics companies	• information as a most important intangible good • improvement of planning process along the whole supply chain • improvement of customer service • increase of customer satisfaction • improvement of capacity utilization • reduction of overtimes of warehouse staff • reduction of waiting times of lorry driver • harmonizing of dashboards and uniform measurement of KPI • Improvement of Supply Chain Visibility (standardized riles and methods)
Stevedoring companies	• improvement of capacity utilization • reduction of overtimes of staff
consignees	• real time data about the delivery status • further processing of information into different areas like warehouse, production, customer service, etc.

5 Conclusion

This article discusses the need for real time information in the Baltic Sea's ferry service. For this purpose, the import and export processes in ferry and RoRo ports are described in order to show the effects of the deviations from ferry arrival times on the maritime transport chain operators concerned. If there are significant delays or cancellations, the actors must be notified in real time via push notification about ETA and other accompanying data. In addition, potentials for companies in the logistics sector are presented by using the ferry real time information. In this context, the existing processes can be made lean and the customer service can be improved. Moreover, real time information can be made available to public transport or integrated into their travel planning systems. The listed benefits show that the Baltic Sea-wide implementation of a real time information system has a positive impact on the processes of the logistics companies involved.

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References

VVW (2015): Verkehrsverbund Warnow GmbH, Final Conference EU project INTERFACE PLUS & Opening ceremony for the cross-border real time passanger information system Rostock (DE) - Gedser - Nykøbing Falster (DK) on 26 March 2015, URL: http://www.interfaceproject.eu/fileadmin/user_upload/Meetings/IF_PLUS_2015_03_25_26_FINAL_CONFERENCE/Press_release_EN.PDF (30.10.2019).

Vojdani, N. (2016): Nutzung der Echtzeitinformationen von Fähren in maritimen Transportketten. In: Vojdani, N. (Hrsg.) 16. Rostocker Logistik Forum, Innovationen in der Logistik, Proceedings, 21.-22. Juni 2016, Rostock: Hahn Media + Druck.

Vojdani, N.; Uhlich, J.-U. (2019): Bedeutung der Echtzeitinformationen von Fähren für intermodale Transportketten. In: Vojdani, N. (Hrsg.) 19. Rostocker Logistik Forum, Innovationen in der Logistik, Proceedings, 22.-23. Mai 2019, Rostock: Hahn Media + Druck.