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Organization of Cargo Traffic Using Ferry Connections

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Abstract

The observed development of ferry transport in the Baltic Sea is associated with the development of trade exchange between the countries of this region. Cargo transportation constitutes a significant part of these carriages. Disturbances in the organization and implementation of transport chains with the participation of ferry shipping may cause delays in the delivery of cargo to customers. Therefore, it is reasonable to look for solutions to streamline the organization of these processes. The aim of the article is to identify the current state and to analyze the organization of the process of cargo transportation with the use of ferry shipping. The ferry line connecting the ports of Liepaja (Latvia) and Travemünde (Germany) was considered in details. On the basis of surveys carried out among truck drivers and owners of transport companies on the ways of transport organization, the selected aspects related to the planning of the transport process with the use of ferry shipping were determined. As a result of the analysis of the data obtained, recommendations were made to improve the organization of cargo transportation in ferry shipping.

Keywords

ferry connections, maritime transport, organization of cargo traffic, market research

1 Introduction

Ferry shipping is a specific type of shipping that takes place regularly between ports on designated routes. Trucks, cars and rolling cargo (rail freight wagons, swap-bodies, tractor-trailer combination, trailers and semi-trailers) can be transported using ferries, as well as it provides passenger transport services. With the help of systematically provided services, it is possible to ensure regular connections and integration of maritime transport with land transport (Ceder, 2006; Saif et al., 2019; Saw et al., 2019; Urbanyi-Popiołek, 2012).

It should be emphasized that ferry services market in the Baltic Sea develops dynamically. At the moment, this market is served by ferries that offer services attractive not only for passengers but also for cargo companies.

Organization of cargo transportation using ferry shipping requires knowledge of available transport infrastructure, the ways to plan the transport chains, actual ferry connections between ports, as well as, processes associated with buying a ticket etc. It should be noted that disturbances in the ferries operation may take place that influence the punctuality of cargo delivery. These disturbances can be related to, among others, adverse weather conditions or defective technical condition of ferries, which may cause difficulties in carrying out the transport orders. As a result of changes in the timetable, sometimes changes in the planned route are needed for cargo transport. In this situation it is necessary to properly organize the information exchange process to eliminate the possible delays in cargo delivery.

The aim of the article is to identify the current state and to analyze the organization of process of cargo transportation with the use of ferry shipping. An additional goal is to examine and compare the opinions of transport company owners and truck drivers regarding the way of planning and organization of cargo transport using ferry connections. This analysis was carried out on the example of a ferry line connecting the ports in Liepaja (Latvia) and Travemünde (Germany). The article is based on the

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research results achieved during RTF project implementation (RTF, 2019).

2 Planning and organization of cargo transportation using ferry connections

The organization of the cargo transportation process begins at the transport company. After receiving the inquiry for transport, the responsible person checks the possibility to perform the service. Usually, this activity is performed by the forwarder, who takes into account the limitations of drivers' working time, available vehicles, specificity of the route, infrastructure and operation of transport network and determines the price and expected date of cargo delivery to the customer (Łukasik et al., 2018; Musso et al., 2010). The possession of reliable and sufficient data enables the forwarder to provide detailed analysis for determining the route and efficient cooperation among relevant actors (Engler et al., 2018; Moschovou et al., 2019).

After negotiating the terms of the service, forwarder accepts the order for cargo transportation, plans the transport route in detail and informs the driver about the place of cargo shipment and delivery. The driver may take part in the process of planning the transport route, however, in some cases he is not allowed to do it due to the companies' procedures.

Depending on the destination of cargo delivery, the transportation may be carried out with the use of ferry shipping. Using ferry connections it is possible to take advantage of forced breaks, during which the driver can take a pre-planned daily rest in accordance with the driver's working time, as well as to save the fuel. While planning the route using ferries, the knowledge on ferries' schedule is needed (Alessandrini et al., 2019; Paulauskas et al., 2019). This information is essential to take the decision on course of the route.

An important element in cargo transport organization is also the exchange of information between the forwarder and the driver. The forwarder is responsible for the entire transport organization process, as well as for control and supervision of individual stages of cargo movement (Murphy and Daley, 1996). On the other hand, during performing the transport process, the driver is usually responsible for driving the vehicle, checking road conditions (e.g. congestions or accidents) and moving the cargo between the places of cargo shipment and delivery along the route marked by the forwarder.

Fig. 1 shows the generalized (exemplary) process of organizing cargo transportation using ferry connections. It should be noted that this process depends on the organization of the

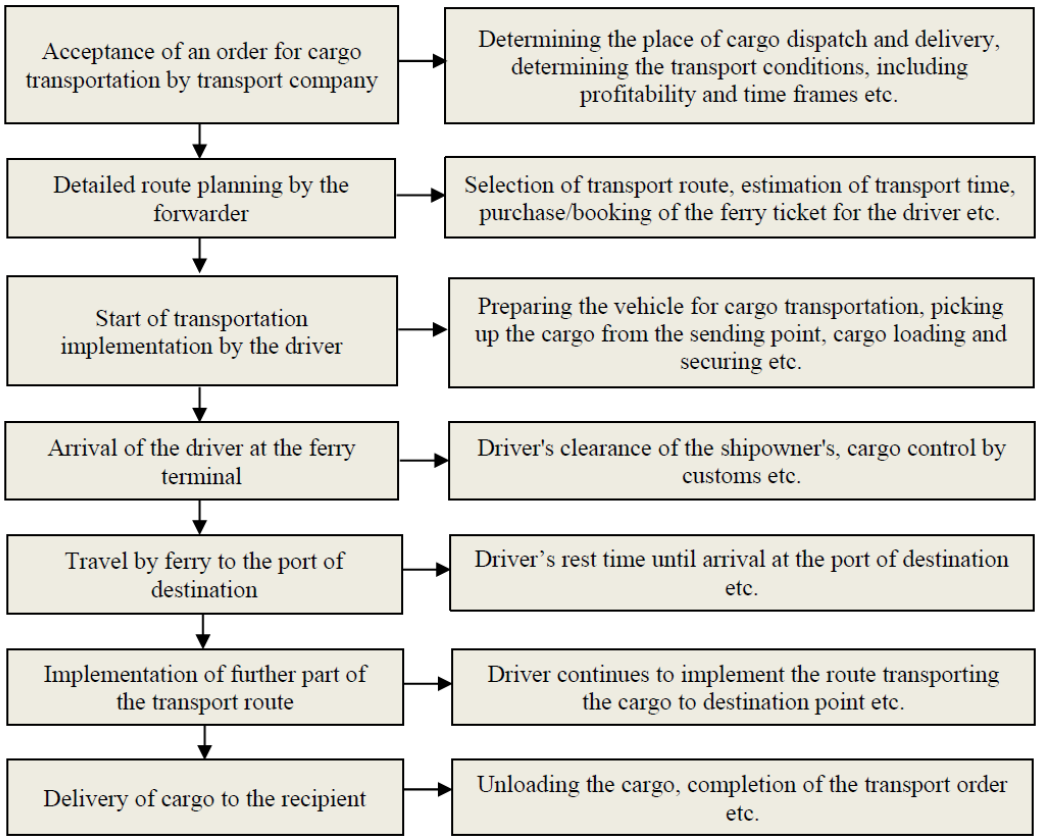


Fig. 1 Generalized (exemplary) process of organizing cargo transportation with the use of ferry shipping

particular actions inside the transport company, on the way the driver is served at the ferry terminal, on its infrastructure, on the type of cargo handled and so on.

Besides the costs of delivery the organization of cargo transport should take into account the time of performed services. Nowadays, cargo forwarding, transportation and logistics is often performed using "Just in Time" concept (Antos and Antos, 2013; Golarz, 2016), which deals with organization of services keeping a certain implementation time. During the organization of cargo transport, the forwarder can identify the barriers preventing the cargo delivery on time and analyze several transport options. However, when planning the route they choose the specific one due to the set criteria. The forwarder's assumptions do not always coincide with the reality that prevails on the road and in the ferry terminal.

In ferry shipping emergency situations may occur that influence ferry delays or cancelations. According to Findley et al. (2018) ferry transport systems often delay travelers due to waiting for service. The waiting time can be defined as the time from the arrival of a passenger, or a truck to the ferry terminal, until entering the ferry. For example, the truck drivers may be stopped at the entrance to the terminal by traffic lights indicating a red color. Delays are dependent on the time of day, day of the week, the supply of transport systems or infrastructure (Andersen and Torset, 2019). Cancellation of ferries appears quite rarely. Most often they can be caused by the occurrence of adverse weather conditions (storm, strong wind, etc.), which may affect the ship's safety. Another reason can be a technical failure of the ship, which may prevent the performance of the transport service and contribute to the cancellation of the voyage by the shipowner.

In case of ferry delay or cancelation, the shipping company informs the forwarder who passes the information to the driver (the delay in information flow may also occur). Sometimes the driver receives the information on the ferry delay being at the ferry terminal. In this case, the drivers cannot take decisions by themselves, they should inform the forwarder and wait for the further guidelines. That may extend the driver's waiting time for further actions and timely cargo delivery.

According to research carried out by Mathisen and Solvoll (2010), in Norway, most ferry users will be satisfied with the service when the probability to miss a planned departure (due to queue) is unlikely. This indicates another problem associated with the organization of processes in ferry shipping. Similar situations result in the need to quickly inform drivers to enable them to make changes in the planned route, in order to ensure delivery of cargo to the customer on time (Kujawa, 2015; Andersson and Ivehammar, 2016). For that reason, it is important to assure efficient flow of information between the forwarder and the driver. Such information flow may be based on digital applications and systems (Yang, 2019).

One of the ferry lines operating in the Baltic Sea is the Liepaja - Travemünde line performed by StenaLine carrier. Services on this line are provided, among others, for trucks, trailers and semi-trailers. This line is used by companies transporting cargo between Eastern and Western Europe. The route is served 5 times a week by 2 ferries (Stena Gothica and M/F Urd). The journey by ferry takes 27 hours (Stena Line, 2019).

Based on the observations of the processes of cargo planning and organization in selected countries in the Baltic Sea region, it can be concluded that detailed review of the ways to organize the cargo transport with the use of ferry shipping is required in order to look for ways to improve it (RTF, 2019).

3 Methodology

In order to analyze the process of organization of cargo transportation with using ferry connection the literature analysis and interviews with people involved in the planning of cargo transport and handling on ferry terminals were carried out.

The market research was chosen as the research method. The surveys were developed to investigate the opinions of truck drivers and transport company owners on cargo traffic functioning. The surveys contained various questions, including ones about the organization of freight transport using ferry connections.

The online questionnaire form was activated on 21/02/2019 and was opened until 16/04/2019. The questionnaire was sent by emails to 458 transport companies and was distributed among the drivers, who used the Stena Line ferry services from the port in Liepaja (Latvia) to Travemünde (Germany).

The questionnaire was filled by 99 truck drivers and 35 owners of transport companies. There were the drivers of trucks, tractors and trailer units, buses and minibuses. Among the transport company owners there were directors, managers or other employees responsible for the companies' functioning and development.

The obtained data was analysed in detail and the opinions expressed by drivers and owners of transport companies were compared. On this basis the appropriate conclusions were drawn.

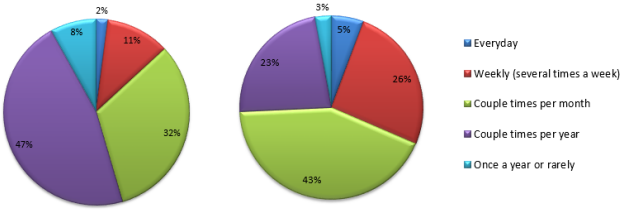
4 Results

The analysis of the responds on the proposed questions includes both drivers and transport company owners opinions.

The questionnaire filled by respondents included general questions, such as: "How often/frequently do you use ferry line Liepaja – Travemünde?". Fig. 2 shows the frequency of use of the Liepaja-Travemünde ferry line by the surveyed persons. The largest number of surveyed drivers (47% of responses) used the line several times a year and several times a month (32% of the 99 respondents). The questionnaire was also filled by drivers (Fig. 2 (a)) who used the line every week (several times a week), which means that they regularly travel with goods between Eastern and Western Europe (11% of all respondents taken part in the survey). 2% of the drivers indicated the answer "Everyday", which may mean that they use or used the line every time the ferry arrives at seaport.

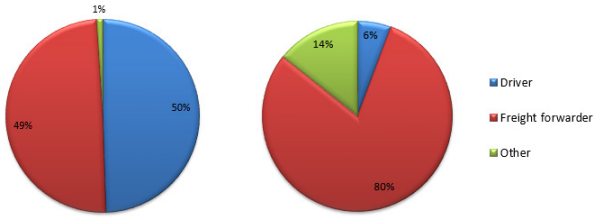
In case of transport company owners' opinions, the responds were divided as follows (Fig. 2 (b)): the largest number of enterprises (43%) indicated the use of ferry connections couple times per month, 26% of companies use these services every week (several times per week) and 23% of respondents several times a year. Therefore, it may be concluded that most of the companies and drivers who took part in the survey use the line on a regular basis, carrying out transport services between the eastern and western parts of Europe.

Next question aimed to investigate who was responsible for planning the route of cargo transportation using ferry connections at the time of the survey. Fig. 3 shows the percentage of responses made by drivers (Fig. 3 (a)) and transport company owners (Fig. 3 (b)). The drivers indicated that



(a) (b)

Fig. 2 Responses on question "How often/frequently do you use ferry line Liepaja – Travemünde?", where: (a) drivers' opinion, (b) transport company owners' opinion



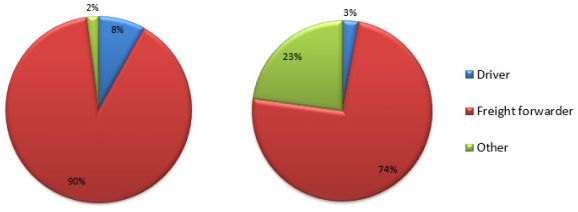
(a) (b)

Fig. 3 Responses on question "Who currently plans a transport route?", where (a) drivers' opinion, (b) transport company owners' opinion

the route was either planned by the forwarder (49%), or was determined by the driver (50% of respondents). The last may result from running a sole proprietorship, in which the driver is both the owner and forwarder, or from the difficulties on the roads where the forwarder prefers the driver to set the route. 1% of respondents indicated other option, which included determining the route by the travel agency.

In turn, analysing the transport companies' owners opinions, it should be mentioned that in most number of entities the freight forwarder was responsible for planning a route (80% of responses). In selected cases the route was determined by the driver (6% of respondents) that may be related, among others, to running a sole proprietorship, or to company procedures, which may allow the drivers to determine the route on their own. Other responses also included other employees of the company, e.g. dispatcher (14% of answers). On this basis it may be concluded that generally forwarders plan the route from one destination to other, but drivers may influence the specific way of route performance.

Then respondents shared their opinions on question "Who currently books/buys a ferry ticket?". The answers on this question allowed to get knowledge on way of planning the route using ferry connections. In the case of drivers (90% of situations (Fig. 4 (a)), this activity was performed by the freight forwarder responsible for the specific transport of the cargo. Only 8% of drivers bought or reserved tickets themselves. Respondents who marked this answer could meet with an emergency situation when



(a) (b)

Fig. 4 Responses on question "Who currently books/buys a ferry ticket?", where: (a) drivers' opinion, (b) transport company owners' opinion

they had to buy a ticket themselves, they could run their own business or a transport company or allowed drivers to buy the tickets. A small percentage of drivers marked "Other" option that means that ticket was purchased by a travel agency or other responsible company.

It also turned out that 74% of the surveyed enterprises indicated the responsibility of the freight forwarder in charging of a ferry ticket (Fig. 4 (b)). Only in 3% of companies the drivers bought/booked the tickets themselves. Respondents who have marked this answer can run their own business activity, or the transport company allowed them to plan the route and buy the tickets on their own. 23% of respondents marked the option "other", indicating that the ticket could be purchased by a company employee, dispatcher, accountant, etc. Therefore, it could be stated that in the most of surveyed companies nowadays the forwarder plans the route using ferry connections, books the ferry tickets and informs drivers about the ferry. Comparing these answers (Fig. 4) to the answers on previous question (Fig. 3), it should be noted that in cases when the drivers planned the specific route by themselves, the route using ferry connection was mainly planned by forwarder.

In order to set the method of purchasing the ferry ticket, the respondents were asked to indicate one or several of the proposed options (Fig. 5). It turned out that 83 drivers did not know in what way the ferry ticket was purchased or booked by transport company. 32 respondents pointed out that tickets were booked using the carrier's website (Stena Line, 2019). The purchases of tickets using the mobile application and ticket offices are used quite rarely.

Furthermore, it was found that 19 out of 35 representatives of transport company owners (54% of them) did not know how the ferry tickets were purchased/booked by forwarder or other authorized person. It means that they were not involved in the specific activities performed on lower management level. 24 respondents (69%) marked that the tickets were purchased or booked using the carrier's website. Purchases of tickets with mobile apps were indicated only for 4 out of 35 answers. Buying or booking tickets in paper form is not preferred option nowadays and got zero answers. The received answers confirmed that drivers are not involved in booking the ferry tickets and do not have knowledge on the way it is purchased.

One more question was directed to the transport company representatives. It was related to the person who takes the key decisions regarding implementation of modern tools (applications, software) to improve the transport processes organization (Fig. 6). It was found that in most of the examined companies (74% of them) such decisions are made by company owners. Among the decision-makers there are also people dealing with transport management (14%), as well as representatives of the management board, project managers or IT technicians (12% of all responses). Neither drivers nor forwarders or logistic operators have influence on company decision making.

5 Conclusions

The organization of cargo transportation using ferry connections is a process that requires the exact information (e.g. on the ferries schedules) and elasticity in taking decisions. That gives the opportunity to decision-makers to plan and organize the cargo traffic efficiently without delays. The changes in ferry connections may influence the route for cargo delivery and may require quick response to the occurred changes.

The analysis of the process of cargo traffic organization using the ferry connections on Liepaja-Travemünde ferry line example shows that the transport route is generally planned by forwarders who also purchase/buy the ferry tickets for drivers from the shipping line's websites. In case of ferry cancelation or delay it may influence the time of decision-making and result in longer time of cargo delivery. Providing the changes in the route also belong to the forwarders nowadays.

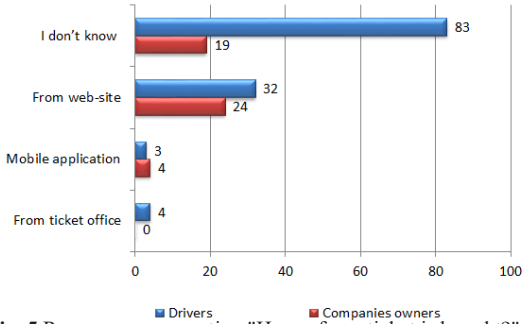


Fig. 5 Responses on question "How a ferry ticket is bought?" (responses number)

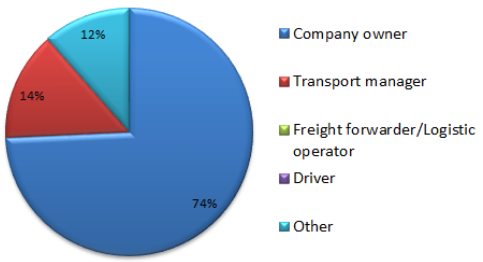


Fig. 6 Responses on question "Who in your company takes decision on the implementation of modern tools (applications, software) for improvement of transport processes organization?"

It should be stated that new solutions and improvements should be provided in the process of organization of cargo delivery. In case of ferry delay or cancelation, the drivers might have the opportunity to take decisions independently on choosing the route, buy/book or cancel the tickets by themselves. Moreover, the information about changes in ferry schedules the driver should receive directly from shipping line to react as quickly as possible and provide the changes to the transport route accordingly. In this case the decision-making process would be shortened significantly, and the driver as an experienced person could influence the punctuality of cargo delivery, taking into account current road conditions, information obtained by the CB radio and other channels. That additional activity in planning and organization of cargo traffic may influence the time, cost and elasticity of process performance. The detailed analysis of the possibilities to introduce these solutions in practice will form the direction of our further research.

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