A Ro-Ro Entrepreneurship as a Technology Start-Up Project

Kerem Sahinboy*‡

* Yeditepe University, Faculty of International Trade and Logistics, Istanbul

‡ Yeditepe University, Faculty of International Trade and Logistics, Istanbul, Tel: +905355994476,

kerem.sahinboy@std.yeditepe.edu.tr

Received: 20.09.2019 Accepted:26.03.2020

Abstract- Road freight services, which are a vital part of cargo deliveries in Europe, have been sensitive to technological developments. Trucking companies must incorporate ferry routes into their operations by using high-end technological reservation tools in order to gain a competitive role in the hard freight market. Given the increased demand and limited quantity of ferry routes, trucking companies have faced several difficulties in previous years including cost forecasting, space guarantees on board, and difficulties choosing the right ferry services with the best ticket prices. The aim of this study is to explain the importance of using web-based technologies for ferry bookings for transport companies in all European routes, focusing on Feribot.com as a business model. In order to provide a unique, technological, user friendly, multilingual, instant ferry ticketing The Feribot system works as a B2B platform and is connected with ferry lines via a data connection. Customers have the advantage of buying ferry tickets at up to 45% discounts when comparing prices to ticket offices at ports. This research concludes that Feribot.com is a spectacular example of the benefits of technological developments in e-commerce and entrepreneurship in the transportation industry, particularly in the ferry booking field.

Keywords Logistics, Shipping, B2b, Software.

Özet-Avrupa'daki kargo teslimatlarının hayati bir parçası olan karayolu taşımacılığı hizmetleri teknolojik gelişmelere önemli derecede bağlantılıdır. Kamyon şirketleri, nakliye piyasasında rekabetçi bir rol kazanmak için feribot güzergahlarını operasyonlarına ileri teknoloji ürünü rezervasyon araçları kullanarak dahil etmelidir. Artan talep ve sınırlı miktardaki feribot güzergahları göz önüne alındığında, kamyon şirketleri önceki yıllarda maliyet tahmini, gemide yer garantileri ve en iyi bilet fiyatları ile doğru feribot hizmetlerini seçme güçlüğü gibi çeşitli zorluklarla karşılaşmışlardır. Bu çalışmanın amacı, Feribot.com'a bir iş modeli olarak odaklanarak tüm Avrupa güzergahlarındaki nakliye şirketleri için feribot rezervasyonları için web tabanlı teknolojilerin kullanılmasının önemini açıklamaktır. Benzersiz, teknolojik, kullanıcı dostu, çok dilli, anında feribot bileti sağlamak için Feribot sistemi B2B platformu olarak çalışır ve veri bağlantısı üzerinden feribot hatları ile bağlantılıdır. Müşteriler, fiyatları limanlardaki bilet ofisleriyle karşılaştırırken% 45'e varan indirimlerle feribot bileti satın alma avantajına sahiptir. Bu araştırma, Feribot.com'un, özellikle feribot rezervasyon alanında e-ticaret ve girişimcilik alanındaki teknolojik gelişmelerin faydalarına muhteşem bir örnek olduğu sonucuna varmaktadır.

Anahtar Kelimeler Lojistik, nakliye, B2B, yazılım

1. Introduction

Ro-Ro transportation is a floating highway connecting hundreds of points throughout the European continent. Developing market structures, delivery frequencies, and product varieties diversified the number of Ro-Ro voyages, the effectiveness of the used ports and the demands of customers using this method of transport. The Ro-Ro connected transportation method, which was originally used as a mandatory requirement, has now become a service in high demand. 67% of road transport to the UK is provided by Ro-Ro voyages and the rest is provided by Eurotunnel. The connection of an island country, such as Ireland, to England and the rest of Europe is made entirely possible by Ro-Ro voyages when it comes to road transport. It is possible to call Ro-Ro routes 'motorways of the sea' (Pau Morales Fusco, 2016). Ro-Ro services, which can be classified as a sub-division of short sea shipping in Europe, are considered one of the solutions to congested road networks and one of the driving forces for improving the competitiveness of the EU economy (European Commission DG Mobility and Transport, 2015). Between the Netherlands, France, Belgium and the UK,

more than 30,000 trucks and more than 40,000 vans, passenger cars and derivatives are shipped from one side to the other on the British Channel. Ro-Ro transport is the most dominant, most economical and most environmentally friendly maritime highway between Germany and Denmark, Germany and Sweden, and Poland and Sweden. IT is possible to travel from Ystad to Swinoujscie, Travemünde to Trelleborg, and Rostock to Gedser with the help of scheduled voyages organized by the main commercial ports. Food, frozen seafood, palletized cargoes, and flammable, explosive, hazardous materials and oversized loads can be delivered safely and on time. In addition, the Baltic States (Lithuania, Latvia, Estonia, Russia and Finland) have more than 30 different Ro-Ro routes between Germany and Sweden. Ro-Ro connections provide efficiency and effectiveness to road transport companies, and carriers can operate more semi-trailers with fewer tractors. 'Motorways of the sea', where lorries or their trailers make part of their north-south or east-west journeys across Europe by specialised ferries are successful, reliable examples of how to get freight off the roads. (European Commission, 2012). 73% of all Ro-Ro lines considered do not have alternative routes, out which approximately 63% are connected island regions. This does not mean, however, that they do not contribute to sustainable transport development (Kotowska, 2015). It is apparent that the share of Ro-Ro shipments among short sea shipments within Europe have significantly increased (European Commission DG Mobility and Transport, 2015)

Freight units, particularly semi-trailers or shipping containers on mafi platforms can be shipped on ferries from one port to another without accompanying trucks. Ferry operators have their own hauling machines to haul trailers on and off the ferries at both the port of departure and arrival. This service creates a gain of 30% for Ro-Ro customer shipping companies paying for freight per meter. A standard truck is 17 meters long (hauling tractor + semi-trailer). When only 13.6-meter semi-trailers are loaded, the transport companies pay 3.4 meters less in freight and need fewer personnel to manage a greater number of load units. This service saves time, human resources and undeniably money as truckers pay for only 13.6 meters in length instead of 17 meters for a complete truck and trailer. They can also haul more cargo units with a smaller number of drivers, fewer tractors, less fuel consumption, and lower maintenance fees in addition to savings from cheaper ferry tickets. Ro-Ro transport in Northern Europe is a good example of the high number of connected ports and the quality of infrastructure services offered. On the other hand, similar productivity can be observed in Southern European Ports. Ro-Ro connected voyages are clustered in Italy in cargo transportation. With the Ro-Ro voyages made between Greece and Italy, Italy and Spain, and Turkey, Italy and France, 1.5 million freight vehicles are transported between Pendik and Trieste, Genova and Barcelona, Durres and Bari, Pendik and Toulon, and many other ports with the help of reciprocal scheduled voyages. It is possible to say that Ro-Ro transportation is the most efficient, technologically advanced and environmentally sensitive method in multimodal cargo deliveries. A Ro-Ro short sea vessel can carry considerably larger amounts of cargo than a truck (Andreasson, Louise; Liu, Shan;, 2010) .Thanks to the MARPOL regulation introduced in 1973, it has become imperative for all Ro-Ro vessels serving in Europe to use low sulphur bunkers. Vessels operating in the Baltic Sea, the North Sea and the British Channel are obligated to use fuel that has less than 0.10% sulphur in it (Grimaldi Group Finnlines, 2017).

The new generation of modern ships equipped with the latest technology and modernized fossil fuel consumption rates have been reduced by 52% due to cargo transport. The vessels providing service have accelerated and the number of voyages have increased. Thanks to increasing competition, ticket fees paid by trucks have decreased and the quality of food, bath and accommodation opportunities offered to drivers on board have improved. The medium-sized Ro-Ro vessels, which can carry 4,000 lane-meters and more than one load at a time, 200 17-meter trucks can be shipped at once. Ro-Ro voyages, which are efficient at short distances, have up to 300 nautical mile radius connections depending on the high-efficiency ships built and the changing international market structure. Ro-Ro routes have also become widely used for relatively long routes such as Norway to England, Germany to Norway, Germany to Finland, Germany to Russia, and Turkey to Italy and France. U.N. Ro-Ro is one of the largest Ro-Ro companies that operates in European routes and was established in Turkey. The company scored over 180,000 trucks shipped in between Turkey and Italy and France in 2015 with 1,100 corresponding departures [10].

2. Literature Review

With the elimination of borders in the European Union for member countries, the quantity and diversity of cargo-carrying vehicles, which benefit from Ro-Ro services, has also increased. In addition to freight transportation, the intensive movements of passenger cars, especially caravans, between the north and the south have made it necessary for ship operators to use advanced technology to respond to the number of vehicles booked and handled in the market. Besides innovative handling technologies, digitalisation has gained importance in combined transport and generally in the logistics sector in recent years (International Union of Railways, 2016).

Since the main task of ship operators is the management of Ro-Ro ships moving on certain routes, most sales and marketing activities have been transferred to sales agents. In the beginning, these sales agents, which sell tickets at many points in Europe in tourism offices, have focused on online sales services with the development of web technologies. As a result of the diversification of the market demand, B2B platforms have been created solely to sell tickets for freight vehicles. Available online ticket sales platforms do not sell only Ro-Ro tickets. In addition, they offer enriched and diversified services such as tunnel crossings, highway fees, bridge crossing payments, and VAT refunds.

Online B2B Ro-Ro sales agency organizations, which have been previously available in England, France and Germany, have spread to Eastern Europe in the last ten years and have begun to sell real-time ticket reservations to customers with low prices and fast response times. Marisa,

one good example of an online ferry booking system actively operating in Alytus, Lithuania, responds to the demands of customers from the Baltic States. Marisa, founded in Lithuania, is one of the first companies to sell tickets to trucking companies and provide services to Baltic region cargo carriers on a web-based reservation system. Marisa has built up their own software designed in-house and develop it continuously. They link local customers by connecting them with the databases of ship companies and allowing clients to book multiple routes in a short time. Transferry.com is another reputable company in the ferry booking market, which has been dealing with freight bookings since 1980. Motis.com is an Irish ferry agency that also has several offices in the U.K. Transconsult-cz.int is a transport company and ferry booking agency with headquarters in Prague. Transconsult is active in central and eastern European markets. Czechia, Slovakia, and Poland have large quantities of trucks in their inventories and Prague is the strategic location to sell tickets in these markets. Transcamion.com is a German ferry operator with online booking services. The company has more than 40 years of experience in ferry ticketing sales and is a well-known entity in the industry.

Ship operators do not have sufficient time, human resources or established capital to reach a large number of customers from different regions and varying degrees of financial credibility. When examining building costs, the value of a newly built classical, conventional medium-sized ship is estimated at approximately 100 million Euros [4]. Even this information shows the focal point of Ro-Ro line operators. Truckers, especially those located in Eastern Europe, are usually small and medium-sized enterprises. Many local truckers want to take advantage of discounted ticket fees, late payment options, customer service in the local language, 24/7 support and other advantages with Ro-Ro reservations. The likelihood of a small-business sized trucking company in Turkey or Iran of meeting a Ro-Ro operating company in the North Sea that responds to such demands as indicated above is relatively low compared to the regional sales agents providing local and customer-oriented services. Ferry operators prefer to deal more with big accounts, such as regional ferry ticket sales agents or selected transport companies which use Ro-Ro lines a thousand bookings or more per annum. Small and medium-sized enterprises, which outnumber such big accounts, can be contacted, acquired and managed as customers thanks to their primary sales agents being in different countries.

Contracts are made between the Ro-Ro lines and the ferry agents based on sales turnover and / or number of passes per year. A contract provides, with a letter of bank guarantee provided by the agent, a discounted price table and late payment terms for the regional ferry ticket sales company. With technological opportunities, sales networks, regional reputations, personal relations and good control of the market, sales agents can reach a large number of customers in countries where they have sales permits. On the other hand, depending on their own initiative, sales agents take the risk of payment collection by offering late payment terms to trucking companies on behalf of Ro-Ro lines. This is a transparent system based on a win-win agreement for all, the ship operator, the agent and the trucker.

The efficient cooperation between ship operators and Ro-Ro sales agents is not just based on financing and marketing. The acquisition of a Ro-Ro or Ro-Pax (ships carrying passenger and cargo units), operational cost calculation, and long-term cost sustainability require intensive operational responsibility. Although the fixed costs associated with Ro-Ro vessels are known, bunkers and several other surcharges vary on a monthly basis. Fluctuations in bunker prices are reflected in the cost per meter of tickets and are announced to all customers through regular newsletters. Other surcharges with variable costs, such as the Low Sulphur Surcharge used in Baltic & North Sea routes and the Winter Surcharge (as known as the Ice Surcharge) used in ports in Finland and Russia, cause changes in Ro-Ro ticket prices. For a small trucking company, following up on these ever-changing costs, checking current ticket prices, monitoring timetables, deciding on feasible Ro-Ro connections and selecting feasible ship operators requires a great time investment. It is a dedicated and stand-alone task in a company. This task is quite difficult, as it is open to errors and misunderstandings because it is based on relatively complex calculations. In this sense, online platforms that provide web based B2B booking services are an effective and valuable solution for providers that supply the automation the industry needs. Thanks to pricing algorithms, online ferry booking platforms can update surcharges continuously and in real time for a large quantity of routes and Ro-Ro lines including variations such as dates, vehicle types and commodity classes. In addition, these online platforms simplify the pricing system for the easy understanding of customers, so they do not have to deal with tasks like surcharge validation or fee calculation. A trucker can submit basic information such as departure and arrival port, boarding date, time, load type and tonnage, and number of drivers via the web, screen the price, make a reservation, pay, and have their ticket number in seconds. From this point of view, Ro-Ro booking platforms serve as a facilitator with their unique online B2B format.

3. Customer Needs

Feribot.com, designed by Ferco Shipping LLC, was established primarily to provide services to markets in Turkey, Bulgaria, Romania, Iran, Ukraine and Russia and is the first online B2B Ro-Ro reservation system in Turkey. The Feribot system is intended to provide reliable, fast and affordable ferry reservation services to its customers through its C# software language, SQL database and .net technology. Thanks to its parametrically designed infrastructure, Feribot operates with software that makes all business processes dynamically manageable, including country, city, port, route, ship line, cruise, costs, customer roles, user groups, downstream user authorization, credit control, and billing and reporting. Feribot's system acts as an electronic bridge between the trucker and the Ro-Ro company and connects the customer with the Ro-Ro operator directly. The customer's reservation is processed and finalized via the connection between Feribot.com and Ro-Ro line servers. A typical booking can be confirmed within seconds. Alternatively, if there is a lack of space on the desired ship, the booking will be added to a Waiting List. The customer can view the final confirmation,

ticket number, and booking status on his / her screen and change the reservation within the defined critical periods online. Feribot.com broadcasts its services in Turkish, Bulgarian, Romanian, English and Russian thanks to its multilingual interface. According to the contracts with the ship operators represented, the Feribot system makes sales in countries such as Turkey, Bulgaria, and Romania and can also collect payments through local bank accounts in these countries. The operations of Feribot.com are divided into two parts: the back office and the client side. In the first step, as a potential customer, a trucking company is visited by a Feribot sales representative. During an interview, the customer's needs and expectations, number of vehicles, Ro-Ro lines desired for future use, financial structure, and monthly or annual Ro-Ro usage numbers are examined. After the meeting, the risk limit of the customer is determined by Feribot management, a quotation is generated about the lines to be used and submitted for the signature of the potential customer. After the e-commerce agreement and the current account agreement are approved and signed along with the price proposal, the customer receives a master username and password. The customer can create multiple usernames and passwords for different employees under their main account on Feribot.com. The system defines scales of customer credit limits between five thousand and twenty-five thousand Euros. Each time the customer makes a reservation, the system decreases the invoice amount from the pre-defined risk limit. Each booking results in a real time decrease in the customer's credit limit. Once the customer reaches their pre-defined risk limit, the system suspends their booking screen until a certain amount of payment is submitted by the client. Feribot's system provides simplified interfaces that are specially designed for users who are unfamiliar with online business. The user first selects the port of departure, the port of destination, and the desired boarding date and time. They complete the reservation by defining the vehicle's license plate(s), vehicle type, cargo weight, number of drivers and dangerous cargo class (if any). If the shipping line is linked to Feribot.com, the reservation data is transmitted directly to Ro-Ro Line's web services and the result of the booking appears on the customer's screen in seconds.

The general results are "reservation confirmed" or "waiting list is approved as vehicle number XX". The driver of the truck company can visit the ticketing office of the Ro-Ro company in the relevant port with his / her license plate information to obtain a printed ticket if needed. A small number of ship operators can only manually confirm reservations for a variety of reasons (lack of technical infrastructure or unavailability of online booking features in their IT systems). The Feribot system has solved this problem by using a one-time token link sent via email to the booking office of the Ro-Ro line. Authorized personnel at the Ro-Ro line can click on the link in the e-mail and write the approval status and number directly into the Feribot system. With this method, the booking confirmation process takes a period of about two and up to five minutes. In the third operational method, Feribot sends the online reservation to the ship operator manually by e-mail or fax. This method is preferred by small ship operators providing services on a very small scale and is not an integrated method in the business model of Feribot. The manual booking processing method accounts for less than two percent of all reservations handled by Feribot annually.

The booking process and steps are made traceable to both the employees of Feribot and the customers with the help of colours. When new booking data is entered into the system, it gets 'New Booking' status and turns brown in colour. The 'Processing' step is yellow, the 'Confirmed' step is green, the 'Invoiced' step is blue, and any 'Booking is Cancelled' step is red. When a customer's payment is received by Feribot's system, related invoices change to 'Paid' status and become grey.

In 2018, 12,500 vehicles were booked by the Feribot system. The average ticket price was 250 Euros. Weekends, especially Friday evenings, were the most congested and highly demanded days for ferry bookings by truckers. Demand is usually clustered in the evening between 6:00pm and midnight. It is common practise in the transport industry that commercial transports are consolidated over the last working day of the week, and the transfer of freight vehicles using the last shipping hours of the day has an important role in the emergence of this data. Since Feribot provides active service to truck companies in Turkey, on certain routes, the nature of business flow goes through. Turkish truckers use the following routes most frequently: Rostock to Trelleborg, Swinoujscie to Ystad, Rostock to Gedser, Calais to Dover, Genoa to Barcelona, and Igoumenitsa to Bari. The system also provides services in addition to the selling of Ro-Ro tickets, such as Örosund Bridge reservations between Denmark and Sweden and Frejus Tunnel reservations between France and Italy.

The Feribot system currently has 37 Ro-Ro ferry lines, 165 different routes, and 2,350 different tariffs registered. It is not possible for such a large system to be managed without a technological structure with integrated connections. Considering these figures, it is possible to consider Feribot a large online supermarket for Ro-Ro bookings.

Besides the qualitative benefits of the Feribot system, its quantitative utility is its price advantage. Feribot as a wholesaler and whole buyer of ferry tickets grants access to lower price scales thanks to its consolidated volume of business. These prices, adding an affordable profit margin to the top, are supplied to trucking companies with much smaller booking capacities. This is what creates a market segment for online service providers like Feribot.com. On some ferry routes the prices that Feribot supplies compared to the prices available at Ro-Ro line ticket offices might be up to 40% lower for Feribot customers. For example, the Rostock - Trelleborg ferry route, which is offered by TT-Line, costs 535 Euros for a one-way, 17-meter truck ticket with a cash payment at the port. The sales price of the Feribot for the same is 379 Euros and can be paid up to 21 days late in the case of a late payment agreement. In this sense, Feribot.com is not only a ticket sales website but also a digital and commercial highway between the final consumer and the Ro-Ro line.

Feribot is a single, complete, fully functional Ro-Ro booking system with its own invoicing and payment collection management modules. Revenue item records (invoices) of

actual reservations are automatically generated by the software and sent to customers by e-mail. In order to ensure that profit and loss accounts are healthy, the expected expenses of all bookings are generated by the system at the same time as income items. In this way, the time spent checking and approving invoices from ship companies and solving differences, if any, is minimized. The payment collection system can be managed as a different module in the same system. Customer payment collections are recorded in the system based on each booking and the receivable is displayed on the relevant screens in the system. For example, the customer can see invoices, payments, and statistics on the account statement on his / her screen. The status of the relevant bookings is updated as 'Paid' and the credit risk amount of the customer is increased as soon as funds are received by Feribot.

The most important subject for a commercial start-up such as Feribot is the ability to create effective reports using the collected data in the system. There are six report types that are grouped under the Reports module in the Feribot system: reservation reports, invoice reports, payment reports, accounting reports, customer reports and profit-loss reports. In addition to predefined reports, it is possible to define various types of reports by choice which can be related to different parameters.

The most important difference between Feribot and its competitors is the flexible data structure of its pricing module. There are dozens of different Ro-Ro ship operators in the market and an almost equal number of pricing methods for each. A system must be able to adapt to all of these possibilities easily and without error. Feribot has solved this problem by dividing the pricing algorithm into two divisions as fixed and dynamic variables. Minimum fixed price, loaded vehicle freight unit per meter price, empty vehicle freight unit per meter price, fixed handling fee, port fees per tonne and more than thirty other variables can be compiled and used to create one final price with the help of a single screen. This creates the possibility to produce costs and sale prices on Feribot.com. The system performs profit margin calculations by determining percentages. As the whole cost system changes routinely, the sales prices change in the same way by keeping pre-defined profit margins. The profit margins determined by Feribot may vary depending on variables such as the current market, density of competition, seasonal promotions and the prices of competitors.

Customer satisfaction is the first rule at Feribot, from coding and designing software to adding new routes. The company has bank accounts in Bulgaria and Romania as well as Turkey, enabling customers in these countries to make payments in an easy and cost-effective manner. International customers can buy Ro-Ro tickets with the fastest, most advantageous and easiest method with the help of low bank commissions.

4. Conclusion

The Ro-Ro shipping industry is an active player in multimodal transportation, particularly the shipping of freight units as trucks, tractors-semitrailers, vans, mafi units, etc., and will continuous to serve in this important position in the future. In its 2011 transport white paper, the European Commission set a target of having 30% of freight tonnage moving over distances greater than 300 km onto rail or water by 2030 [8]. This development will be achieved by decreasing the fuel emissions of the vessels, increasing load capacities, diversifying ports and routes, and increasing the frequency of voyages. Considering this mission, Ro-Ro links are more competitive than variations in fuel price and road transportation. Equivalent increases in fuel price for all road transportation and bunkers used for maritime legs increase the competitiveness of ferry services [9]. The most important role in this process will be technological innovation. The role of Feribot and similar start-ups will become more dominant in the future of multimodal transportation as the keyword 'connectivity' is becoming a mainframe rule for all business types, even beyond the transportation business itself. Ship operators may also develop their own online reservation infrastructures and customer integration platforms, but sales agents will continue to actively participate in this race. It is evident that systems offering a wide range of payment options and remittance types (including crypto currencies), multilingual digital platforms, and parametric and state-of-the-art systems will be the industry's only choice. Dynamics such as increasing competition, fuel price trends, and the necessity of environmentally friendly vessels will diversify technological utilization ratios, demand and investments in multimodal transportation in all parts of the transportation sector. Promoting sustainable freight transport systems requires a balancing act between economic, social and environmental considerations [11]. All being considered, Feribot will be among the most preferred e-commerce service providers.

References

[1] Andreasson, Louise; Liu, Shan;. (2010). European RoRo Short-Sea Shipping, What Can Ship Operators Do to Unleash Its Potential. Gothenburg: University of Gothenburg.H. Poor, An Introduction to Signal Detection and Estimation, New York: Springer-Verlag, 1985, ch. 4. (Book Chapter)

[2] European Commission. (2012). Road Transport - A Change of Gear. Belgium: European Commission.E. Kabalcı, E. Irmak, I. Çolak, “Design of an AC-DC-AC converter for wind turbines”, International Journal of Energy Research, Wiley Interscience, DOI: 10.1002/er.1770, Vol. 36, No. 2, pp. 169-175. (Article)

[3] European Commission DG Mobility and Transport. (2015). Analysis of Recent Trends in EU Shipping and Analysist and Policy Support to Improve the Competitiveness of Short Sea Shipping in the EU. Brussels: European Commission DG Mobility and Transport.

[4] Fafaliou, I., & Polemis, M. L. (2016). Competitiveness In The Coastal Ferry Boat Industry. Piraeus: University of Piraeus.

[5] Grimaldi Group Finnlines. (2017). Annual Report 2017. Helsinki: Grimaldi Group Finnlines.

[6] International Union of Railways. (2016). Combined transport in Europe. Paris: BSL Transport Consultants & International Union of Railways.

[7] Kotowska, I. (2015). The Role of Ferry and Ro-Ro Shipping in Sustainable Development of Transport. Szczecin: Maritime University of Szczecin.

[8] McKinnon, A. (2015). Performance Measurement in Freight Transport. Hamburg: Kuehne Logistics University.

[9] Pau Morales Fusco. (2016). Roll On - Roll Off Terminals and Truck Freight. Barcelona: Universitat Politecnica de Catalunya.

[10]U.N. Ro-Ro. (2015). 2015 Annual Report. Istanbul: U.N. Ro-Ro.

[11] United Nations. (2012). Review of Maritime Transport 2012. New York: United Nations.