Implementation of modern information solution for greater efficiency of intermodal transport through Port of Bar
Case Study – NAVIS

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Abstract

Digitalization of logistical processes is an unstoppable process. The shipping companies are imposing new trends on ports that they must follow. On the other hand, the efficiency of shipping goods is one of the basic prerequisites for the competitiveness of a port. In both cases, the port must have an information system developed that will successfully connect the shipping companies to the logistics community in the hinterland. The subject of this paper is the potential implementation of such solution in Montenegro, the US software solution NAVIS. The aim of the paper is to explain the current state and present the benefits that intermodal traffic through the Port of Bar would have by implementing an information solution like this. The methods used in the paper are analyzing data obtained from the official websites of the NAVIS, the experience of ports that use the subject solution as well as analysis of existing processes that take place through the Port of Bar in intermodal transport. The results of the paper will present its hypothesis, the greater efficiency of logistical processes in Montenegro and primarily the Port of Bar which will contribute to a better competitive position of Port of Bar in intermodal transport.

Keywords: Information solution, NAVIS, Intermodal transport, Port of Bar

1 Introduction

A port needs to be seen as a transshipment hub catering for the needs of multiple transport modes that engages many different actors; private and public. With digitalization now entering the maritime and transport sector at an ever increasing pace, attention is now being paid to ensuring that the different modes of transport are much better connected to overcome the coordination and synchronization challenges that arise from port visits. In the emerging digital landscape, the different parties engaged along the transport chain need to take action to improve their coordination and synchronization by sharing the information upon which they have a mutual dependency. An increasing number of maritime and port authorities are now engaged in empowering digital collaboration among the actors in sea transport, and especially in relation to port operations [1]. Today, Small and Medium-Sized Ports (SMSPs), are jeopardized due to increasing pressure on them. The reason for it is lower integration into both horizontal value chains and vertical supply chains, thus, suffering from less freight volumes, missing smart specialization, low cognitive, organizational, or institutional proximity to and between macro-regional, national, EU, and international actors, outdated infrastructure, lack of investments and new business models accompanied by missing hands-on strategic foresight. The Adriatic Sea Region has 67 ports in five countries, of which nine are categorized as Core Ports, while the rest (58) are SMSPs.

Digital transformation in seaports implies huge potentials and opportunities to improve productivity and efficiency in logistics as well as to increase competitiveness [2]. In recent years, major ports around the world have been implementing new technologies to realize “Smart Ports,” in order to enhance international competitiveness, reduce environmental impact, and improve the workplace environment. In addition to the automation and labor-saving measures that have been actively pursued so far, smart ports are nowadays expected to benefit from the Internet of Things (IoT), Artificial Intelligence (AI), and Big Data 1, as well as more focused initiatives, in specific the Physical
Internet (PI), based on the development of high-speed communication infrastructures, such as the fifth generation mobile communication system (5G). The robust use of the numerous digital technologies, such as the ones above-mentioned, offers substantial business innovation opportunities and requires numerous organizational adjustments [3]. Digitalization is expected to play a major role in improving efficiency in container shipping, said Soren Toft, CEO of Mediterranean shipping company, on IAPH World Ports Conference [4]. On official web site of Maersk line is written, "We all buy goods, track deliveries and pay online. Shipping with Maersk is no different "[5]. The digitalization of the economy is going to revolutionize our business. Today, our customers want more transparency, more speed, more immediacy, more interaction and more visibility. This requires a serious rethinking of how to approach shipping, and this is what we have started to do, said Rodolphe Saade, Chairman and CEO of CMA CGM [6]. Hapag-Lloyd has committed to making new investments in digitalization and automation over the next five years, as it unveiled details of its new ‘Strategy 2023’ corporate plan [7]. The container shipping industry is characterized by fierce competition. One way for shipping companies to gain a competitive advantage is to be one step ahead of competition in the digital transformation of their services and processes. Ports are under pressure to keep up with the shipping companies’ demands, inter alia, in the digitization process. Some ports themselves are unable to meet the high expectations of the shipping companies and as a result we see the shipping companies becoming the owners and co-owners of more and more terminals around the world.

2 Research problem

On the territory of the once unique the Port of Bar, today there are two port operators, Port of Adria AD and Luka Bar AD. Container traffic takes place via Port of Adria AD container terminal. Unlike the operator Luka Bar AD, which has its own PCS (port community system), which does not have the ability to exchange EDI messages with shipping companies, Port of Adria AD has a modern information system that has the ability to exchange EDI messages with shipping companies in all container handlings while currently developing a system that will allow EDI messages to be exchanged in the area of invoicing services. However, although the Port of Adria AD information system is at a satisfactory level, the problem is that all the entities involved in the movement of goods via the Port of Bar territory are not connected to a single information system. The documentation structure is accompanied by a contractual documentation and information link between certain parts of the Port of Bar: Service manufacturers, freight forwarders, transporters, warehouses, electronic information centre, port operators, dockers, customs administration and other... one of the serious practical problems is the circulation of documents between different subjects, i. e. errors in numbers and procedures. This problem significantly increases the additional costs. It increases the retention time in certain places, sometimes even leading to the termination of contracts and / or client's confidence. This is why various electronic data processing systems are applied in the Port of Bar, operating on the principle of interconnection of all entities and elements of the integrated supply chain [8]. Within the Port of Bar, there are several basic container operations: unloading, transshipment and loading, control, disposal of cargo, storage and saving, transport, stripping and stuffing, repair and servicing. From the moment the container arrives at the Port of Bar to its loading on a means of transport (train, truck, vessel), several operations are taking place. Unloading the container is followed by a check of its accuracy. The containers are being loaded onto one of the said means of transport or being stripped. Empty containers are first put away and later stuffed with other goods, load onto one of the means of transport and shipped to a specific destination [9]. The flow of information within the port itself, has been well resolved. However, communication with customs brokers, customs administration, transporters, shipping companies representatives, etc. continues to be carried out with a lot of paper documentation which slows down processes and leads to inefficient time use, with higher costs and less competitiveness of the port. After the consignee of the goods sends the documents to his customs broker in Bar, the customs broker with the bill of lading goes to the shipping companies' representative to retrieve the document "Bez Zapreke", the container is free to be taken over from the port. Based on data from "Bez Zapreke", the customs broker
prepares the disposition order to port. The customs broker returns to his office where he prepares it. Since the port asks for the dispositions to be stamped and signed by the shipping agent and the customs administration, the customs broker must get back to the shipping agent's representative to sign and stamp the disposition order. The customs broker then goes to the customs administration to verify the port's disposition and goes to the container terminal. After receiving the dispositions order properly stamped and signed by shipping agents and customs administration, the port worker starts the activities of the work organization according to the subject disposition. Meanwhile, the customs broker returns to his office to prepare a customs declaration where he will enter the number of the truck after the port confirms that it will load that truck. While the port organizes the loading of the container onto the transport vehicle, the customs broker with the customs declaration prepared goes to the customs administration office and surrender a set of papers. In the meantime, he goes to the container terminal to make sure everything goes according to plan regarding the loading of his truck and returns in front of the customs administration office. After the truck comes from the container terminal in front of the customs administration office, the customs broker goes to the container terminal to get an exit from the port, i.e. a confirmation that the truck, after customs administration finish his part of job, can leave the port. After customs files a declaration, gets a way out document of the container terminal for the truck, handing over it to the driver. The customs broker goes to his office to copy the customs-filed documents to archive it for own purpose and the original handing over to the driver. Once the complete process has been completed, the truck can leave the Luke Bar Free Customs Zone. In addition to wasting a lot of time to dispatch one container, there is a lot of walk around the town of Bar. Sometimes, a few dozen kilometers. It costs. Vehicle depreciation, paper documentation, crowds forming outside the offices of shipping agents, customs, container terminals... are some of the problems that make the cargo flow through the Port of Bar significantly less efficient than in competing regional port which have installed NAVIS-Terminal Operating System. Figure 1 gives an operational view from the moment the owner surrenders the documentation to its customs broker until the moment the means of transport leaves the Port of Bar.

Fig. 1. The present manner of communication of logistics stakeholders in the town of Bar (Source: Authors)

3 NAVIS – Terminal Operating System

NAVIS is a provider of operational technologies and services that unlock greater performance and efficiency for the world’s leading organizations across the cargo supply chain. NAVIS combines industry best practices with innovative technology and world-class services, to enable its customers, regardless of cargo type, to maximize performance and reduce risk. Through its holistic approach to operational optimization, NAVIS customers benefit from improved visibility, velocity and measurable business results. Whether tracking cargo through a terminal, improving vessel safety and cargo capacity, optimizing rail network planning and asset utilization, automating equipment operations, or managing multiple terminals through an integrated, centralized solution, NAVIS helps streamline operations. With more than 340 customers in over 80 countries, NAVIS is the global standard for terminal operating systems (TOS). N4 has been implemented at more sites than any other TOS provider, and no other TOS can match NAVIS’ unique capability to optimize the planning and management of container and equipment moves at a terminal. NAVIS N4 scales with business to optimize utilization of IT infrastructure and eliminate unnecessary, upfront capital expenditures. The
flexible N4 architecture allows terminals to create clusters of database and application servers, allowing TOS to grow to meet demand. The NAVIS Smart technology also allows terminal operators to unleash and monetize the vast abundance of data being collected in and around their terminals - including water side and inland - to optimize planning, visibility and asset utilization for all players in their eco-system. All terminals, regardless of the operational type, have to maximize use of their limited resources. N4 optimization solutions help terminal operators automate decision making and elevate productivity across a range of critical operational and business processes. N4 optimization modules take a holistic approach to streamlining operations to ensure that land, labor and equipment are used in the most productive fashion [10]. Most of competition of the Port of Bar and other regional ports uses NAVIS. All cargo and vessel in Rijeka processing is done through Terminal Operating System (TOS) NAVIS implemented on 29.01.2012. It also includes internal processes as well as interaction processes with 3rd parties needed in order to provide smooth and clear container flow through terminal. Main interaction parties are the shipping lines (local agents and vessel planners), freight forwarders and rail operators/dispatchers [11]. **DP World Constanta**, located in the western Black Sea, in Romania, announced that it is migrating to NAVIS' N4 port operations system, Constanta South Container Terminal (CSCT) has operated with NAVIS systems for 16 years and with a current annual capacity of 1.2 million TEUs and an average of 26 movements per hour. "The ability to absorb new and innovative thinking, and see it through, is what sets world-class companies out of the ordinary," said Chuck Schneider, Director of Customer Service at NAVIS. It focuses on innovating and optimizing its assets so that it can offer smarter solutions that enable commerce to meet the needs of its clients and advance global commerce in a reliable, efficient, effective and responsible manner. N4 represents an opportunity for DP World to fully exploit their experience and capabilities as trade facilitators and help drive economic growth in Romania. As the next step ahead, Terminal Container Ravenna TCR started an innovative digital project, introducing NAVIS N4 as the terminal operating system (TOS), DSP DATAVIEW as its Business Intelligence System in order to increase efficiency and productivity and SEVEN by SIS as the customs management system [12]. Terminal Intermodale Venezia (TIV), part of Hili Company, has gone live with NAVIS N4 TOS. On Sunday 23rd June 2019 the first container was discharged from MSC GIOVANNA using N4[13]. Alket Malo, CFO of Durres Port Authority, said, “The implementation of N4 SaaS is a significant advancement for Container Terminal of Port of Durres and one that we firmly believe will lead to improved efficiency across our operations, a more seamless exchange of information with key stakeholders and a broadened portfolio of services that we can offer our customers. Beyond that, the additional layer of security afforded to us through cloud operations, along with increased visibility, transparency, and traceability of our operational processes, will be key to expediting law enforcement activities within the port. Capt. Jan Nowak, Director of ACT Burgas, said: "With the implementation of N4, our terminal achieved a major milestone on our way to becoming a twenty-first century container terminal, operating to worldwide industry standards. Together with the investments we have made in the yard and handling equipment in recent months, this constitutes a significant step forward, but not the end, of our modernization plan. The new operating platform provided by NAVIS opens a range of new opportunities for all port stakeholders and will help us to become the main gateway terminal for Bulgaria, and perhaps, a transshipment terminal for the Black Sea region.” . N4 provides ACT Burgas with a proven platform for the management of its container operations, as well as supports the implementation of standard processes and EDI at the terminal [14].

4 Benefits of possible implementation NAVIS in Port of Bar

Although the possibilities of NAVIS are greater and it is possible to achieve a greater interaction than presented in this paper, the focus has just been placed on the weak points concerning the intermodal activities that are taking place today through the Port of Bar. In this sense, the NAVIS system would provide all logistics stakeholders with a common information environment that would be visible to all and that would be accessible to all from their
offices as regards their part of the work. In a conversation with representatives of logistics companies in Rijeka, which use the NAVIS system, it is clear that customs brokers do not need to leave the office, but do all the data exchange and processing via the computer. There is no need to create queues in front of the shipping companies' offices waiting to be issued with the document “Bez Zapreke” and the signing/stamping of the ports' disposition orders, which creates discomfort for both. There's no need for traffic jams. Also, in front of the customs administration office and terminal there's no unnecessary waste of time and paperwork. All interaction takes place through the common platform NAVIS. The concrete benefits are time and money savings which is reflected in practice in the fact that the customs brokerage service for one container in Rijeka is EUR 15 / container while in the Port of Bar the average price of the same service is EUR 40 / container. Due to the unnecessary waste of time, logistics entities in the town of Bar are not able to devote themselves to the production of added value services and all this together contributes to making the Port of Bar less competitive than Rijeka and other ports that use the NAVIS system. Figure 2 presents a solution for how the interaction with the NAVIS system should look in the Port of Bar.

5 Conclusion

It is argued at the beginning of this paper the importance of Digitalization of logistical processes that an unstoppable process. All the ports of the world must adapt to the needs of shipping companies. The requirements for digitalizing the process are one of them. The efficiency of shipping goods is one of the basic prerequisites for the competitiveness of a port. The research raises an important question on how using NAVIS may increase the cargo flow through the Port of Bar. The regional ports of Durres, Rijeka, Burgas and Constanta, which are the direct competition to the Port of Bar, have already installed the NAVIS system, which is one of the reasons that gives them much better business results than Luka Bar has. Using the methods of analysis and comparison, it is concluded that due to not efficiently connection between logistics stakeholders in Bar, a lot of time and resources is being wasted what make processes of dispatching cargo less efficiency and more expensive. The hypothesis of this paper is confirmed that in the case of NAVIS Terminal Operations System implementation in Bar, the logistics route via Bar port would be more efficiency and cheaper. Additionally, it would bring more time to logistics stakeholders in Montenegro for the new value added services what would bring new value and better competitive position in the region. All of the stakeholders in Bar should keep in mind the importance this topic and work towards realization.

References


