

Digitalization in Transport and Logistics — Modern Challenges and Opportunities

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Abstract—The most important resource for business is time, which plays a crucial role in transport business because “time is money”. Transport is no longer defined as simply transporting goods from point A to point B; it is one of the most dynamically developing economic sectors. A transport firm has to be flexible and active and use innovative decisions in its management process in order to survive in the constantly changing dynamic market. Transport enterprises do not simply provide the standard package of services anymore – they also strive to offer new and innovative decisions whose main purpose is to fully optimize the work process and facilitate the work of all participants in the transport chain.

The main challenge that the big players in the transport business face is making logistics smart, simple and safe. The drive towards satisfying the needs of customers who use logistic services and reacting to market changes becomes possible through the incorporation of innovations in the transport sector. The next step in the evolution and development of the transport sector is digitalization, which is already in motion.

Index Terms—Transport, logistics, digitalization, competition, business models, software, digital ecosystems, transport management.

I. INTRODUCTION

Continuous change is the only constant, and in business the creation and incorporation of innovations is essential to the development and success of transport firms in market economy. Practice in developed countries shows that, despite being a risky undertaking, the incorporation of innovations is one of the deciding factors for increasing the company's effectiveness and competitiveness, as well as retaining and expanding its positions on the market [1]. In recent years transport business has observed the emergence of new market participants, changing consumer demands towards transport services and creativity in business models. In order to remain in the market, a company has to make constant efforts to increase its competitiveness and always search for ways to develop itself in a positive direction and perfect the products and services it offers.

Recently, talks of digitalization have become very active in many other business fields. But what exactly is its place and its contribution to transport activities and the logistics in it? This is the question that transport management has to answer nowadays. Additionally, of significant interest is the fact that West European enterprises are more receptive of new technology in Logistics, they expect their use and view that as

a challenge. Some of the reported undeniable advantages that digitalization offers include: shorter time, minimal mistakes, long-term planning, faster decision-making, etc.

It is also undeniable that nowadays it is much easier to make mistakes when writing and exchanging documents physically. On the other hand, digitally preserved information has the potential to minimize errors and problems, thus saving a lot of time and leading to safer and problem-free communication along the entire transport chain. In addition, processes such as transport reservation, tracking of goods and bill management will become easier and more effective. Storing a large amount of information online not only makes planning ahead possible, but the planning process itself is structured completely differently because it allows better and long-term decisions to be made in the logistic flow when it comes to orders, purchases, volumes and quantities. At the same time, digital decisions will have a positive influence on the environment because it will reduce the number of shipments and create a better flow of goods with higher productivity of deliveries [2].

It is interesting to note that the larger companies in the industry accept the digitalization processes whereas smaller enterprises are significantly more cautious.

II. THE NATURE OF DIGITALIZATION

Digitalization offers us a real opportunity to do things that are familiar and have already been done, but virtually, without limits and everywhere. Applying digitalization is especially important to transport firms – it offers unlimited possibilities for non-stop contacts. Maintaining a positive relationship with consumers is vital to transport firms. Through the buyer-shipper interaction, the customer develops expectations for the shipper's future behavior. In order to meet said expectations, the shipper has to uphold the promise. Good relationships create interdependency between them [3]. Senders would benefit from better information regarding the available transport services. Factories will have information about the time the goods arrive in order to optimize the management and production of their reserves. Providers of logistic services would be able to optimize transport operations in real time and react to unexpected events. Public bodies would benefit from more accurate and more reliable information about the use of infrastructure and cargo, thus contributing to the larger efficiency and operative safety of networks [4]. Digitalization in transport offers opportunities for improving traffic and receiving more timely and accurate information about it. It allows better access and sharing of digital transport data. Digitalization has already been applied to different fields of the transport and logistics industries for

Manuscript received February 15, 2018; revised April 20, 2018.

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both public and private interested parties.

Nowadays, in the age of Logistics 4.0, this is the most modern type of logistics, which is a combination of digitalization and the use of cloud technology, and everything in the network is linked. It is important to specify that the term Logistics 4.0 emerged as a result of Industry 4.0, which was first talked about in 2011 at the Hanover transport exhibition IAA Nutzfahrzeuge. Presently, we are in the middle of the fourth industrial revolution. The possibilities for digitizing transport orders make things easier for all participants in the transport chain, thus making the work process between consignors, shipping agents and shippers significantly more active and effective. Digital innovation is a significant advantage with a single purpose – facilitating the work of consumers. Saving time is fundamental with every transport novelty. The digitalization of documents shortens their processing and the transfer of data between different mediums becomes obsolete.

III. DIGITALIZATION – CHALLENGES AND CHANCES

Digitalization and new technology change the established value chain as well as the chain for networks in which manufacturing companies, providers of industrial services and software suppliers cooperate through digital platforms [5].

As a result, organizational structures and processes have to be flexible and adapted to present circumstances. This requires deep changes in the division of work between manufacturers, suppliers and service providers, as well as all related business models. Cooperation between all participants in the transport chain has unlimited potential. The new digital ecosystems and value networks offer opportunities for cooperation and manufacturing to the entire enterprise [6]. These are companies that include the necessary links to a wide network with added value early on, which is a competitive advantage. Digitalization is not just a challenge, but an opportunity, especially for West European countries. Digitalization plays a crucial role. This is a result of a representative survey of 508 firms with logistic processes on behalf of the German association for information technology, telecommunications and new media (BITKOM) [7].

The latest analyses of transport firms from Germany show that 8 out of 10 firms in Europe use special digital decisions. Three out of four firms see digitalization as a main challenge [Fig. 1]. Large companies predominantly see advantages in digitalization [Fig. 2].

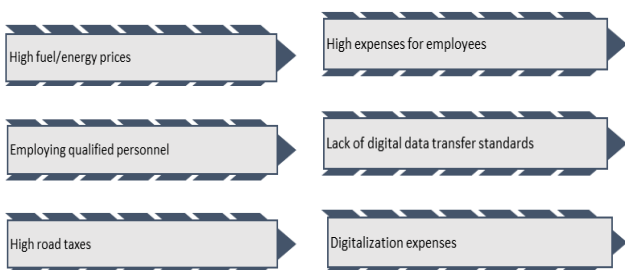


Fig. 1. What challenges could a company face in the field of logistics? Source: BITKOM/ the German association for information technology, telecommunications and new media.

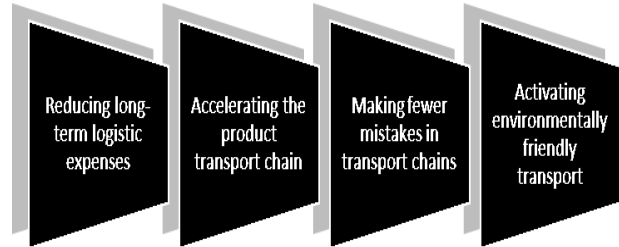


Fig. 2. Advantages of firms using digitalization Source: BITKOM/ the German association for information technology, telecommunications and new media.

In light of the impending changes, it is vital to improve the digital literacy of people who work in the field of logistics. The professional training, preparation, enhanced qualification and over qualification of employees and managers have to be constant throughout the entire work activity [8]. They have to be in accordance with the requirements of the scientific and technical progress, modern economic development, high professionalism and the skills necessitated by the conditions in which market economy operates.

IV. THE NEXT BUSINESS STAGE – INTER-COMPANY COOPERATION!

The new business step is cooperation between companies for data exchange. This stage is especially necessary because it carries a lot of potential.

However, there are certain psychological barriers that the idea of inter-company cooperation faces in the world of logistics: companies are not ready to provide other companies with access to transport management and to their transport data. Cooperation between firms is the only approach – sooner or later, the infrastructure will become insufficient. Roads do not have enough space for the increasing number of trucks – a fact which has been long-known in countries like China and Brazil. Forecasts show that companies will optimize their transport network in a joint effort with other companies [9]; a cooperative world where everyone will benefit from the amassed transport data. In the field of logistics, from a technological standpoint, digitalization has already set the stage for a cooperative world: one of a system based on cloud technology where all transport data is collected in real time and through a multi-channel system. Combined with real-time analyses, social media, mobile communication and cloud technology allow a more effective use of transport networks in the present and in the future – and within all borders.

Social media, mobile devices, data analysis – digitalization revolutionizes the supply chain [10].

With the help of social media all participants in the supply chain can be reached. Anyone can use this technology and no additional apps are necessary. All transport processes such as ordering, tracking and supplying can be processed through mobile devices. With one click the operator can see that the cargo is in the truck. The evaluation is done in real time. It is also possible to immediately respond to delays, to make new arrangements and to keep transport expenses as low as possible. Additionally, transport data is available at all times and accessible to all participants.

V. THE FUTURE STARTS TODAY

In recent years the demands for transport services (cargo and passenger) have increased, resulting in higher requirements regarding their quality. It is for precisely this reason why a strategy with the respective legal and economic conditions for providing public transport services needs to be devised, along with a contiguous infrastructure that will meet consumer demands. The making of mechanisms for increasing transport effectiveness when adhering to the principles for stable development has to focus on consumers' rights, which is a step in a right direction, aimed at enhancing competitiveness, economic growth and the creation of more and better jobs [11].

Forecasting the future and planning the work is possible by doing constant surveys, analyzing the competition and drawing up a strategy for a plan of action regarding a new product or integrating an innovation [Fig. 3].

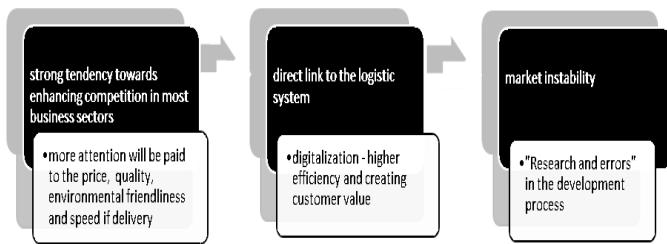


Fig. 3. What does the future hold?

88% of the companies in Germany see digitalization as an opportunity, whereas only 11% view it as a risk [12].

The customer is placed at the start of the chain, and this is the leading principle for every firm. Digitalization influences all manufacturers, forwarders and suppliers of logistic services. The contest for customers is more intense than ever. Customers are in the center of the changes in value, product and service chains. Products and services increasingly adapt to customers' needs.

Most companies expect to strengthen their digital offers to customers by digitalizing existing products or designing new digital ones. Multiple transport and logistics companies plan to expand their digital portfolio in some form. Others move more slowly when it comes to specific initiatives like new digital products or using large amounts of data for improving customer offers. The digitalization of customer relationships has already given transport and logistics companies the opportunity to provide customers with much more control and personalization of the services they receive, as well as the option to add new services.

The main goal that companies strive towards is an error-free customer-oriented process defined by fast reaction time and flexibility. Short deadlines and low logistics expenses are a priority.

Ultimately, whether we like it or not, digitalization is transforming our industry. Therefore, transport companies have to be prepared if they want to stay in the business and continue to be competitive, whereas new participants have to assume more responsibility in the transport chain. More in-depth knowledge and experience will play a defining role when recruiting new employees. A large number of

companies already use digital technology in the field of logistics, others plan a specific application, and others think about purchasing.

VI. CONCLUSION

Digitalization completely transforms transport business. Digitalization is precisely the key to success because it leads to new challenges and new business models.

Digital technology offers multiple benefits in the field of logistics, with long-term reduction of expenses and accelerated transportation taking precedence, followed by fewer errors in the transport chain and more environmentally friendly transport services. However, in order to successfully realize these processes in practice, staff qualification is of crucial importance. In recent years, international practice has shown an increased need for professional specialized preparation of employees in all types of transport. It is also essential for participants in the industrial transport process to have enhanced morale, high value system and personal responsibility in addition to more specific individual, personal, stable psychological and physical qualities dictated by the specificity of industrial transport activities [13].

Digitalization will influence business development in 2018. It does not simply optimize the processes in the work environment – it is the inevitable change which has already begun in the transport and logistics business and the ones who do not accept it will lose. Companies that used to be leaders on the market have to adapt to their own offers. The necessity for simplifying the process, the pressure on expenses and the demands towards the providers of logistic services are constantly increasing.

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