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The Changing World: "Internet of Things – A Factor for the Development of Transport and Logistics"

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Abstract:- The world is changing and we are changing along with it. Information is the most valuable resource. Obtaining data alone is no longer as important as its analysis and processing. Data can influence the planning of enterprises' company strategies. We are in a new era of technology where innovatory decisions and business models constantly emerge; they have a positive impact on the environment. The emerging intelligent reality forms a new future which actively reacts to the transport industry. Internet of Things (IoT) helps shape this future. IoT connects everyday objects wirelessly to a huge network of sensors, which allows problem-free communication between people and objects. It creates opportunities for collecting significant amounts of data which can be used to improve understanding and planning in business and to save energy and human resources in everyday life. The fact of the matter is that things are changing more rapidly than ever in the transport industry and the logistics industry. The activity of internet users has forced transport companies to change their internal processes, storage structures and delivery deadlines. Consumers dictate these changes by shopping online with their phones even when they are on the move. A company can enter the competition only if it has the appropriate equipment and technical innovations. The world of logistics and transport is in a new phase of development and that is connectivity.

JEL Classification Numbers: N70, O14

Keywords:- *Smart Logistics, Internet of Things, IoT, Cloud Platform, Digital Transformation, Smart Logistics Industry*

I. INTRODUCTION

The reason behind the important role that Internet of Things plays is the amount of opportunities that companies can have by integrating IoT into their bodies. The main advantages include optimization of the processes for generating worth for existing products and the opportunity to enter new markets. New technology makes digital transformation possible in multiple branches, and in fields such as transport logistics and fleet management the benefits are significantly large. The bodies of these industries are based on services for mobility, copious data and IoT, making their services automated. The management of the Cloud-based processes and applications leads to a real revolution in this sector. The basis for the new business model places the customer at the center, creating a whole new level of competition in the field of transport, logistics and fleet management. Because of the changing business environment, the question is not "whether" companies participate in digital transformation, but rather "how" they participate. The IoT revolution will lead to countless improvements in all industrial sectors, but transport and logistics are the two fields for which the advantages of IoT will prove especially significant.

II. WHAT ROLE DOES "INTERNET OF THINGS" PLAY FOR TRANSPORT AND LOGISTICS?

High-speed Internet is something normal and accessible – thousands of devices have Wi-Fi connection. All of these factors influence the creation of "Internet of Things". It is the network of physical devices, vehicles, buildings and other elements that are fitted with electronics, software, sensors, actuating mechanisms and connected to the Internet network; all of this allows these objects to collect and exchange data. IoT is undoubtedly the biggest technological revolution currently happening, with big opportunities for a more stable life. In the past ten years companies have reduced the size of available resources for transport and logistics, all the while forcing the teams in charge of transporting goods to customers to be more effective. By offering visualization in real time to the entire transport fleet and operations, along with astute view and analysis, IoT will make critical decisions easier. The end-to-end Cloud network, which is capable of communicating with all devices, will reduce labor expenses and improve the time for orders, since people are not a necessary part of the operation. After the order appears, the IoT system can receive stock, packaging, labeling and dispatch much faster than human work force can. The improvements in the transport sector start with fleet management, which can be the most important part of transport and logistics, especially for companies which have a large quantity of vehicles on the road for delivering goods. Knowing the location of each vehicle, the amount of time necessary to deliver a package and the routes drivers take can provide companies with much more data in order to determine some of the problems with the deliveries.

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The connection also helps companies communicate with their technicians (drivers) anytime and anywhere, which allows them to be proactive with on-location repairs, maintenance, etc. – with real-life updates under certain conditions like bad weather or traffic (Brand et al., 2015). Additionally, firms can equip cars with additional sensors to ensure that the package is at the right temperature and it has not been damaged. As Figure 1 shows, the implementation of IoT in logistical operations can have an exceptional impact.

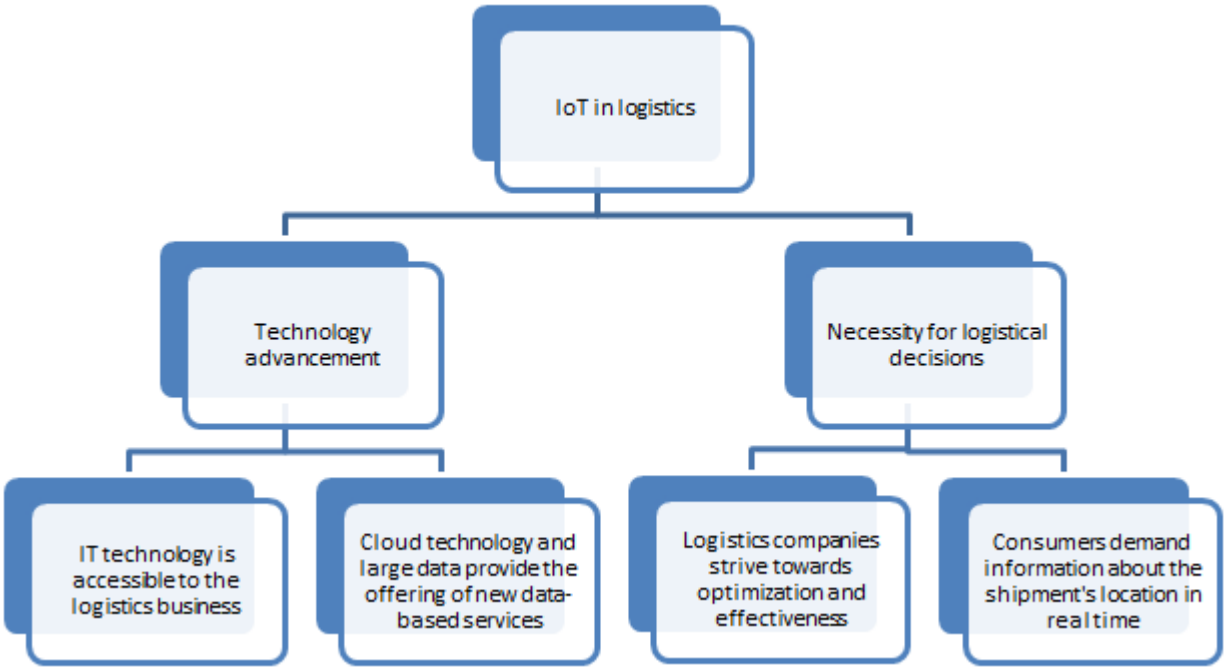

Fig 1:- IoT in logistics
Source: DHL Trend Research (2015)

IoT is a valuable tool which helps optimize business processes and master digital transformation. Over 50 billion devices will be connected to the Internet by 2020: smartphones, tablets and products for everyday use (Alioto, 2017). All of these devices collect data in real time. The way of business is undergoing a radical change. IoT technology provides automated mechanisms for extracting data from machines in data storages or other big platforms for analysis. Simply put, IoT is a concept in which the devices we use have built-in modules for Internet connection and, therefore, the ability to communicate with us and among each other. Summarily, this is a network where devices "speak" and work without human interference. Multiple firms have already discovered the advantages of using mobile technology; however, the unpredictable nature of fuel expenses, the growth of wages, the increasing traffic and the changing regulatory environment continue to make operations challenging. With the emergence of today's mobile technology and IoT, enterprises can speed up productivity, profitability and operations with decisions specially designed for their processes. With the right IoT decision, enterprises can connect all devices in a centralized Cloud network and capture and share their critical data, gaining visibility in real time of their operations. (DuBravac, 2015)

III. CHANGING THE BUSINESS MODEL

Database management, Cloud technology and mobile devices help create a whole new working environment. Every organization has to improve its structure and incorporate new technological innovations in order to optimize its overall work process and therefore offer better services and responses to the needs of the market and the customers (Tzvetkova, 2017). Transport and logistics have to be improved in a number of areas. Transport and logistics enterprises aim at increasing the effectiveness of the supply chains in order to maintain profitability and viability. However, to reach this level of effectiveness, they have to make improvements along the entire chain. The complete visibility facilitates more effective and timely decisions and reduces delays through faster detection of problems. Mobile devices, barcode scanners and mobile computers have become the biggest influence on the visibility of the supply chain and operations. The important thing about firms from the transport and logistics branch is the punctuality of deliveries and reception, the inventory accuracy, the faster processing of orders and the reduction of labor expenses. Mobile technology provides businesses with visibility of the equipment, inventory and business processes. This intelligence of the business process allows organizations to increase their effectiveness by providing them with data in real time along its entire supply chain. Although these types of decisions have already helped

transport and business logistics improve over the years, the use of technology like IoT could lead to even more intelligence in the process, which in turn leads to more proper decisions. Storage is at the basis of transport and logistics. Its effectiveness directly influences business expenses and competitiveness. Thanks to IoT-supported mobile devices designed for tracking inventory data, equipment and vehicles, enterprises can create their own physically active digital voice. By transforming the physical into digital, transport and logistics storages can capture and share their Cloud data, guaranteeing that they have the right products in the right location at the right time. By reducing human interference and sharing information between machines and machines, enterprises can increase effectiveness and punctuality significantly.

As for transport and logistics, fleet management plays a key role in the management of maintenance schedules, the everyday use of vehicles and the service routes. In order to increase productivity and operating efficiency to their maximum, the fleet's time of stay has to be minimized. Only with mobile scanners, computers and radiofrequency identification systems can enterprises gain visibility into their assets and simplify their operations to preserve their fleet's mobility. Aside from that, with real time, an accurate view on the maintenance history, the availability of parts in inventory stocks, technologists can resend information back to their central database. By using connected mobile devices, enterprises can capture, share and manage data around the moving assets in the enterprise. The connection also provides enterprises with the opportunity to communicate with their technicians (drivers) anytime and anywhere, which allows them to be active with on-location repairs, maintenance, etc., with real-time updates under certain conditions like bad weather or traffic. The transport and logistics industry relies on decisions which can safely move their people and cargo, and on efficiency – something which becomes increasingly complicated since fuel expenses remain unstable, and the growth of wages, the increasing traffic and the regulatory environment often change. Operation become more and more challenging, but transport and logistics remain essential to the enterprise's productivity and the access to real-time data is a critical component. Today's mobile technology and IoT offer enterprises the chance to speed up their productivity, profitability and operations with decisions specially modified to their business processes. The implementation of the right decision about IoT could allow enterprises to connect all their mobile devices in a centralized Cloud network and capture and share their critical data. This provides organizations with real-time visibility of their operations and therefore it allows significant improvements in productivity and effectiveness.

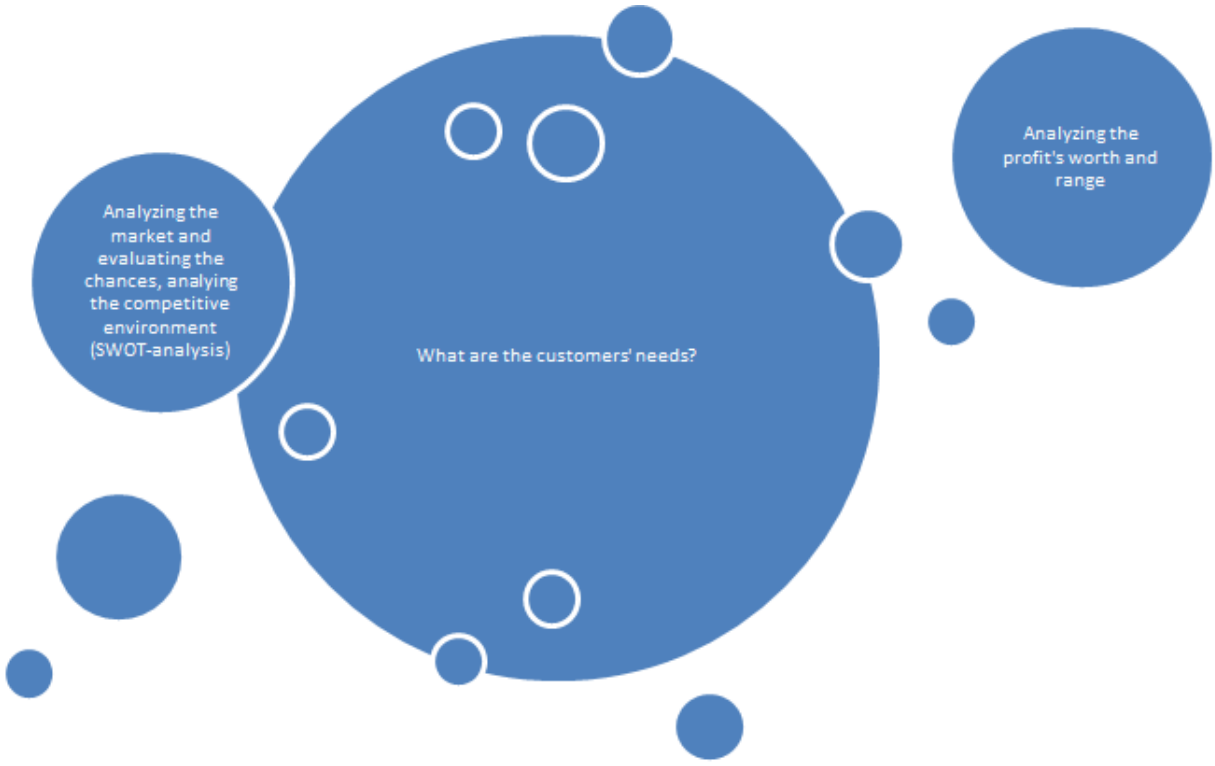

Fig 2:- Three key phases in building a successful IoT strategy
Source: Authors

In order to use these opportunities successfully, whether it is about connectivity, storing data in Clouds, their processing and analysis or machine learning, a plan has to be made. There are three key phases in building a successful IoT strategy, as shown in Figure 2.

Companies should ask the question "Why?" more often. Very often there is a disconnect between customers' desires and needs, which itself could lead to mistakes in services. Customers' real needs have to be the basis for the creation of every strategy and the integration of every

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innovation. This analysis is necessary, so that the global tendencies and the driving forces of the relative market can be seen clearly. (Tzvetkova, 2015) The documentation of unsatisfied customer needs, the identification of the most important issues that eventual future customers face, are part of the constant evaluations that companies make. Often, when a firm is new to the Connected Devices field, the success of the project can be measured with the type of experience that is gained and what analyses are done. Businesses actively use decisions involving IoT because the use of IoT reduces operating costs, increases productivity and the firm can enter new markets or develop new offers for products, as shown in Figure 3.

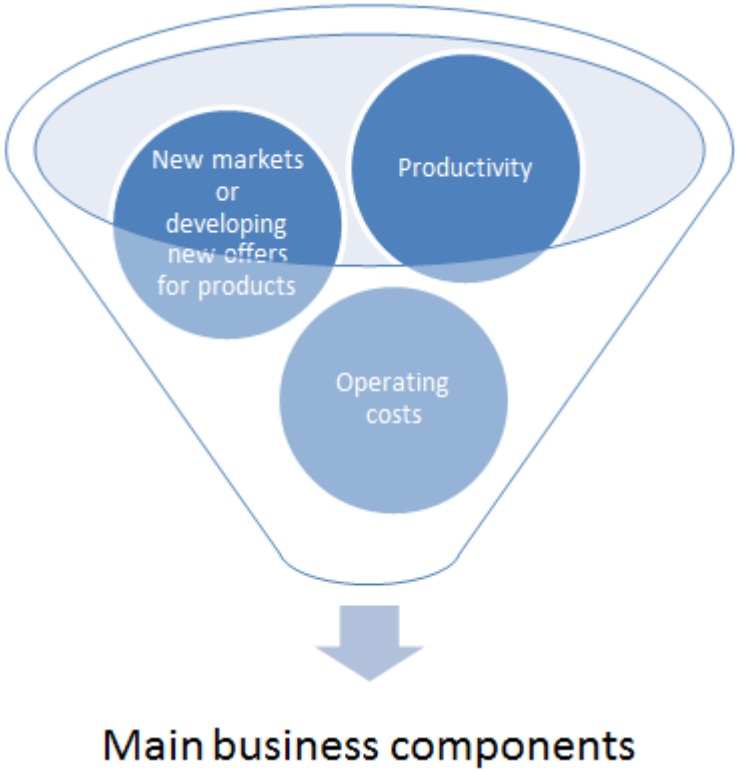

Fig 3:- Benefits of using decisions based on involving IoT
Source: Authors

What customers want to receive through Internet of Things is primarily facilitations in their work routine, decisions for optimizing the work processes and quick and easy access to their own database. It is for the same reason that firms actively invest thousands of euros into integrating Cloud technology and IoT in their work process. The question that business analysts and managers ask is "What is the business worth of IoT-generated data?". Collecting this much data is an undeniable advantage, but the real challenge is the capability of analyzing all this data and studying the future of IoT projects in the enterprise.

Making decisions related to data, under the correct use of data from different sources, could create a competitive advantage by combining data collection with data analysis. Telematics is another important moment. In countries like Great Britain, Franc, Germany and BENELUX telematics decisions reach almost 70% of market coverage. Telematics can also help obtain data about the effectiveness of drivers and vehicles, track trailers and traffic and navigation information, as well as reduce documentation by sending digital proof of delivery.

IV. SECURITY IS THE MOST IMPORTANT ASPECT

Through IoT for transport logistics logistical objects or "things" can process information, communicate between each other and make their own decisions. IoT connects more devices every day and we are headed for a world which by 2020 will have 24 billion devices with Internet connection. This growth has several advantages, since it will change the way people fulfill their everyday objectives and potentially transform the world. However, these advantages are accompanied by risks – the increased number of connected devices gives hackers and cyber-criminals more entry points. Companies also have to incorporate security in the software applications and network connections which are linked to these devices. The pure amount of data that these IoT devices can generate is staggering. (Kleinhans, 2016)

V. PICTURING THE FUTURE

Internet of Things makes life more vital and stable. Environmental protection is always on the agenda of European projects. End-to-end data platforms and "smart services" increase energy efficiency. The necessity for investing in new hardware and software in order to expand IoT is a fact, but without excellent analysis, multiple sensors will not be able to provide competitive advantage. The main goal of companies is to analyze and make better decisions about their work processes (Tzvetkova, 2014). This change of the business model will make the future look very different. Logistics involves working with a large number of objects like cargo, pallets, packages, trucks, ships, planes, etc. All of these objects have the potential to deliver important information with which they provide comfort and new opportunities. We are only at the start of the IoT revolution. Currently only 1% of all 1.5 trillion objects which can benefit from the availability of an IP address are connected.

The average consumer in developed countries is surrounded by dozens of devices that can be connected – computers, tablets, phones, electrical devices, accessories, automobiles, etc. By 2020 computers (PCs, tablets, smartphones) are expected to comprise only 17% of all Internet-connected devices. The other 83% will be the result of IoT. "The Internet of Things" will revolutionize decision-making. The connection of more and more objects from the supply chain creates a unique opportunity for optimizing the time and accuracy of decision-making by analyzing the necessary information in real time. This creates prerequisites for significantly faster cyclic recurrence, dynamic processes, B2B adaptivity, potential for productivity approval and it involves multiple and various opportunities for the logistics branch. Operating efficiency, security and quality are only a fraction of them. All of this provides opportunities for solving various operating and business questions in an innovative way. It facilitates the work process of every consignor: every type of transport, cargo and destination is easily organized; suppliers are chosen in accordance with customers' needs; private or public auctions are started in minutes; offers are compared in real time (price/transit time); communication with suppliers is fast and easy; the location and status of the delivery is tracked; the necessary documentation is exchanged and stored; delays and damages are acknowledged… in rating; professional transport statistics is analyzed; an archive of every freight is available; recurrent operations are automated; there is more time for decision-making. There are two main lines of development: 1) Real-time observation of various assets and their parameters within the supply chain; 2) The processing and visualization of a conscription of data, which in turn leads to better decisions and new opportunities. The moment when faster, more secure and informed access to transport-logistics services becomes available. Web tools are in accordance with the good practices in trade and transport. Because of the new business, firms must exercise caution, so as not to lose direct contact with their clients; therefore, every firm from the digital economy needs a platform strategy in order to keep track of the changing environment and know how to react.

VI. CONCLUSION

Internet of Things began as a strategy which turned into a revolution that is changing our world on a daily basis. Whether it is in ground, railway, aerial or sea transport, IoT decisions are developed and used for overcoming traffic jams, for safety, for reducing pollution and for the efficient transportation of goods. Companies become increasingly influenced by technological trends. As usual, companies that correctly determine the direction of the technological wind will succeed in using it to expand their markets. The negative impact of logistics on the environment, the ineffective work with cargo and the misuse of trucks are important factors for the emergence of new policies through the introduction of innovations. The objective of EU programs is: to increase the effectiveness of transport and logistics in order to enhance the power of European logistics on the global market and increase competitiveness, as well as to significantly reduce CO_2 emissions. The substantial economic, social and ecological potential plays the role of an argument for changing logistics with significant commitment. Companies who know their customers and their potential customers can achieve this success. The more information they collect and analyze in order to determine the desires, needs and preferences of their customers about a given product or service, the more effective their business will be. Best-case scenario: tools for copious data provide rapid analyses according to the scope, at minimal expenses and almost in real time. The industry and large businesses will become the IoT center. Thanks to the creation of networks and more intelligent planning of plane routes, car routes and logistics on a global scale, the world could save up to 1.9 giga-tons of CO_2 every year. An intelligent environment in which IoT could protect the environment and improve people's lives could be created.

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