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SHORT COMMUNICATION

Innovation management in logistics

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ABSTRACT

Electronic and IT technology, transforming the figure of the old world many times, constantly contributes to the development of many scientific fields. Nowadays, we can not imagine communication between enterprises, institutions or personnel communication without information technology. One of the effects of the dissemination of this technology is the Internet, which is applicable in almost every field. The purpose of the considerations is to approximate the importance of the role of innovative management in logistics. To achieve it, selected current literature sources were taken into account, analysis of cargo transport by road was presented. Moreover special attention was paid to the relationship between the management process and selected examples of innovation management techniques and tools that currently dominate the market and are used by major organizations.

Keywords: management innovation, electronic technology, logistic management

1. INTRODUCTION

The beginning of the twenty-first century is identified with the debut period communicate using information technology. It is expected that in the future, barriers and boundaries of communication between enterprises and countries will disappear thanks to hi-

tec technologies. The progress of the global economy supported by the most modern technologies, forces enterprises to market competition through the use of communication tools that allow the transfer of multimedia content and to exchange information in a changing and dynamic environment more and more quickly. Nowadays, we can not imagine communication between enterprises, institutions or personnel communication without information technology, which is a combination of the latest systems, both information technology and information technology. Organizations that in the modern world do not use modern technologies cease to be leaders in the market and are heading towards failure.

The increase in the use of technology by the global community makes the organization to promote, among others, online. Modern network systems that use various forms of communication for multimedia communication, including text, voice or image, providing information belong to computer systems in which the time factor plays a particularly significant role. Innovations in logistics have the right benefits both in times of crisis and well-being. They allow to reduce costs, better use of resources and faster response times, and hence the faster response of companies to the ever changing market conditions. Innovativeness of solutions in the area of logistics also allows for a positive distinction on the market. In an industry in which reliability, punctuality and efficient use of resources play a key role, innovations become inevitable. The technological role is particularly important. The purpose of the considerations is to approximate the importance of the role of innovative management in logistics. To accomplish it, selected up-to-date references were included, analysis of freight transport and road transport were presented. Moreover in particular the relationship between the management process and selected examples of innovation management techniques and tools in logistics are currently being marketed and used by major organizations were also shown [1-10].

2. THE DEVELOPMENT OF LOGISTICS IN THE WORLD

Transport is one of the most dynamically developing sectors in the global economy and is essential in all types of human activities. The implementation of transport tasks are necessary in eliminating the time and spatial disproportions between the occurrence of demand and supply. The growing complexity of economic processes means that transport contributes to creating the market value of products and satisfying customer needs. Customers expect faster, more efficient and reliable deliveries, which makes them look for innovative solutions. All innovations and scientific and technical progress allow to increase economic, financial and environmental efficiency, and thus to maximize management results.

The analysis of statistical data from the Central Statistical Office regarding the volume of transport of goods by road (in million tons per km) from 2012 to 2016, detailing the countries conducting statistics, was presented in Table 1.

Analyzing Table 1 should be noted that not all countries in the world create statistics carriage of goods by road and that transport in the world is constantly evolving and maintains a similar level at the turn of the years studied. The largest increase in cargo volumes was recorded in United States, Germany, Poland and Turkey.

Table 2 presents statistics on the transport of passengers by road (in millions of passengers per km).

Table 1. Roads – Goods transported 2012 to 2016.

C O U N T R Y	2012	2013	2014	2015	2016
Australia	196 511	200 594	205 502	211 182	219 083
Austria	26 088	24 212	24 731	24 816	-
Belgium	32 104	32 797	31 809	31 729	-
Bulgaria	24 388	27 237	27 922	32 351	35 402
Croatia	8 649	9 133	9 380	10 439	11 336
Czech Republic	51 228	54 893	54 092	58 715	50 315
Denmark	16 678	16 077	16 196	15 338	15 956
Estonia	5 797	5 991	6 307	6 259	6 979
Finland	25 458	24 428	23 401	24 486	-
France	165 742	165 216	159 454	148 645	150 928
Germany	302 261	301 377	305 652	.	-
Greece	20 839	19 204	19 222	19 764	-
Hungary	33 735	35 817	37 516	38 352	39 902
Iceland	786	808	850	911	-
Italy	124 015	127 241	117 813	116 819	-
Lithuania	23 449	26 338	28 067	26 485	30 974
Luxembourg	6 687	7 215	7 912	7 093	-
Latvia	12 178	12 817	13 669	14 690	14 227
Mexico	233 464	235 427	239 710	245 136	-
Netherlands	70 084	72 080	72 337	68 899	67 961
Norway	20 168	21 312	21 591	23 143	-
Poland	233 310	259 708	262 860	273 107	303 560
Portugal	32 275	39 624	36 335	34 523	34 567
Russia	255 062	257 144	253 159	238 171	-
Romania	29 662	34 025	35 136	39 021	-
Slovakia	29 504	30 005	31 304	33 525	36 106
Slovenia	15 887	15 914	16 273	17 912	18 715
Spain	199 206	192 593	195 765	209 388	216 992
Sweden	41 011	42 090	41 956	41 498	42 685
Switzerland	10 875	10 939	11 297	10 972	-
Turkey	216 123	224 048	234 492	244 329	253 139
United Kingdom	163 026	151 441	147 321	163 555	-
United States	2 765 230	2 848 152	2 914 345	2 963 457	-

Source: Central Statistical Office

Table 2. Passengers carried 2012 to 2016.

C O U N T R Y	2012	2013	2014	2015	2016
Australia	288 031	290 362	292 670	296 202	-
Belgium	128 046	121 530	123 980	122 240	-
Bulgaria	9 233	8 916	10 145	10 231	9 757
China	1 846755	1 125090	1 099680	1 074270	-
Croatia	3 249	3 507	3 648	3 377	3 802
Czech Republic	73 275	73 676	76 270	79 701	82 512
Denmark	67 039	67 551	67 027	67 544	66 544
Estonia	2 490	2 619	2 569	3 315	2 995
Finland	72 810	72 655	73 060	73 835	65 262
France	785 418	789 418	798 785	816 325	838 397
Germany	972 319	980 246	995 190	1 008771	1 027629
Hungary	68 661	68 788	70 163	72 221	74 300
Iceland	5 454	5 611	5 899	6 296	7 301
India	10 393000	11 756000	13 383000	15 061000	16 950000
Italy	680 180	722 138	745 726	778 990	807 564
Latvia	2 358	2 325	2 345	2 232	2 190
Lithuania	36 578	35 846	27 038	27 322	28 215
Mexico	480 690	484 776	494 128	508 498	518 368
Norway	64 492	65 251	66 770	68 805	-
Poland	20 012	20 039	21 449	21 570	19 168
Romania	12 584	12 923	14 061	17 471	18 744
Russia	133 306	126 379	127 353	126 622	123 509
Slovakia	32 235	32 321	32 532	32 799	33 665
South Korea	355 200	359 928	368 516	378 044	-
Spain	375 576	370 375	348 173	363 942	-
Sweden	118 473	118 518	120 628	122 357	125 162
Switzerland	93 488	95 150	96 690	98 209	-
Turkey	258 874	268 178	276 073	290 734	300 852
United Kingdom	687 323	680 960	693 964	696 997	-
United States	5 116780	5 155873	5 179001	5 356301	-

Source: Central Statistical Office

Data presented in the table No. 2 allow to observe in the examined period the increase in the popularity of road transport among passengers in the countries carrying out statistics.

The largest increase in passenger numbers was recorded in India, United States, Germany, France, Italy. One of the areas of the company's operation, which can be attributed a special role in the creation of new products is marketing. The goal of marketing activities is to create, communicate and provide value to customers, which are actually new market opportunities. One of the leading trends in global logistics is to move towards pro-ecological solutions that allow reducing the emission of harmful substances in the product supply chain. This is a consequence of arrangements concluded at the international level. The United Nations Convention on Climate Change requires individual states to significantly reduce their carbon dioxide emissions. In the case of the European Union, it is a 20% reduction in greenhouse gas emissions by 2020, regulated by energy policy. In England, "The UK Climate Change Act" obliges to reduce carbon dioxide emissions by 80% by 2050. In the USA, the "Global Warming Solutions Act", imposing an obligation on all states to reduce emissions by 25% by 2020.

Usually missed, but important from the perspective of material flow area is the reverse logistics, which is increasingly seen as a source of increasing value and build competitive advantage. The policy developed and implemented in this field concerns the introduction of innovative solutions in the configuration of the waste collection system, waste treatment and recycling to the supply chain (reusing), re-use of the product part (remanufacturing) or recycling of materials or energy. In addition to re-use, reverse logistics problems are focused on providing safe and environmentally sound methods of waste disposal and landfill disposal. Innovations in reverse logistics can take many forms and usually involve the development and implementation of new technological solutions or the construction of new recovery installations. The logistics sector is crucial for the global economy and all kinds of economic activities, conditioning procurement processes, production and distribution and sales in the local and global dimension. It is also one of the most important factors determining the economic development of countries.

3. INNOVATIONS IN LOGISTICS MANAGEMENT

The modern economy has such huge transport needs that traditional investment in production factors does not guarantee their satisfactory coverage. Already today we reach the limits of traffic intensity, also the free spaces are limited, which can be developed for the needs of linear or point infrastructure. Therefore, it seems necessary to popularize new technologies that allow for the change of traffic organization in a limited economic space. With this in mind, the aim of this study is to identify innovative solutions in the field of transport, which in the future may revolutionize the implementation of logistics processes.

Analyzing innovation in the organization should pay attention to the issue of knowledge management and technology. The development of new products, the rebuilding of the production process, the creation of new ideas and marketing depend on them. The managers and entrepreneurs, their courage to bear risk, ambition, creativity, dynamics and leadership style have a significant influence on innovation. An additional form of innovation is the organizational culture, knowledge, skills of employees and the incentive system rewarding for innovative initiatives. Modern organization management is associated with skills and flexibility and adaptation of management qualifications to the changing market expectations. An important factor of competitiveness is the possibility of a dynamic response to changes in

the micro and macroeconomic processes. Skillful introduction and use of innovative information technologies gives the organization the chance to develop modern technologies that contribute to improving the attractiveness of the company in the market.

Entering a supportive IT management system in an organization is a very important stage nowadays. Knowledge about the development and possibilities of using devices and programs is the basic factor in the implementation of the virtual reality management system.

The fields of virtual reality interest in logistics are successively:

- Planning layout and creation concept - 3D visualization tools are needed to improve communication, the advantage of this concept is fast modeling;
- Production simulation - it allows to test and verify production plans, check material transport, control rules, buffer size and location, as well as search for so-called bottlenecks, the real data of a given production process should be made available for this type of simulation;
- Operator training - due to different types of simulation processes, it is easier to conduct trainings. Besides software for this type of training should be correlated, giving a holistic approach to the production system;
- Operational use - the use of simulations in various types of operations, thanks to their implementation, planners can develop the best and the most efficient way to conduct a given operational process.

There are many advantages that result from using virtual reality to model the logistics management process, for example:

- Costs reduction;
- repeatability;
- Time control;
- Ensuring legality and security;
- Dynamic and transient effects;
- Non-standard distributions;
- The impact of various types of random events;
- Development of numerous creative attitudes;
- Promotion of comprehensive solutions;
- Makes people begin to think;
- Provides a good idea.

Logistics companies in the world compete with each other in ever newer applications of electronic technology. A great example of such technology is the augmented reality that DHL used in its logistic centers, giving the possibility of quick access to electronic information displayed in glasses that display processed information allowing for efficient movement around the logistics center. The device displays information that streamlines the logistics process, while collecting products, it indicates the exact location of the package and the alley number. Standard code scanners requiring hand support, thanks to the innovation of augmented reality have released hands from scanners and increased the efficiency of employees in the logistics center. DHL plans to use the expanded reality in the supply chain from the sender's door to the recipient's door.



Picture 1. DHL Augmented Reality

Source:<http://www.computerbild.de/artikel/cb-News-PC-Hardware-Vision-Picking-DHL-Google-Glass-11416485.html>

Innovations are often combined with changes, although many authors point out that innovations implement many beneficial changes for the organization. Innovations also contribute to higher quality, lower costs and reduced customer service time. Thanks to innovations, we can meet more consumer needs, while increasing the profitability of the company, moreover, the level of innovation affects the image of the company, the ability to gain a competitive advantage and maintain the market.

The change of production location, joint venture, new supply and sales markets, changing needs of buyers and the growing dynamics of external conditions of functioning belong to the main decision problems of international concerns, which solving somehow enforces the implementation of innovative solutions. Innovation is perceived not only as a way to generate a competitive advantage, but as a condition of staying on the market.

3. CONCLUSIONS

Logistics has huge, but untapped, innovative potential. In a trade whose key role is played by reliability, punctuality, and efficient use of resources, innovations become inevitable. The problem of innovations in logistics is not widely described in the literature, while innovations play an important role in the implementation of logistics processes. The use of new virtual solutions in logistics, such as the Internet or various types of IT solutions provides many benefits. The use of various types of simulations leads to the development of the best solutions, and extensive IT systems and the Internet allow for faster information flow. As a result, information flows much faster, both between individual employees of the company as well as between the company and its clients. It gives a huge opportunity for companies to manage the use of newer and better virtual sources.

New information technologies force enterprises to change business models and management strategies. Traditional structures will provide flexible forms geared towards continuous real-time interaction with consumers. There are no standard solutions that would allow efficient and effective implementation of this process, while at the same time in all enterprises it requires adapting to the needs, situations and strategies of each cell. Further research requires the structuring of factors determining the potential of innovation and the development of a model for innovation management in logistics.

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