



## LOGISTIC INNOVATIONS IN TRANSPORT

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**ABSTRACT. Introduction:** The article discusses the issue of logistic innovations in transport. The essentials of logistic innovations in transport together with some examples of specific innovations are presented. The role of the client's needs in transport innovations is indicated. The most vital postulates affecting the innovativeness of shipping companies and derived from the author's experience as well as scholarly publications, are time, safety, reliability as well as comprehensiveness of service offer. Following the analysis of the issue, and on the grounds of Kaizen's and Lean's method, the concept of continuous innovations is suggested as very useful for the development of transport. The potential of clusters as the source of logistic innovations in transport is emphasised.

**Methods:** The discussion of the issue was preceded by the author's analysis of written sources on innovativeness, the evaluation of ratings of innovativeness as well as the analysis of rewarded innovative solutions in transport subsequent to the businesses participation in the programme of innovative solutions in transport. The role of innovation practical business operations is argued following the analysis of some strategic documents such as: 2011 White Paper and the Strategy for the Development of Transport by 2020 adopted by the Polish government in 2013.

**Aim:** The aim of the article is to present the role and significance of the issue of logistic innovations in transport and to cite instances of practical solutions implemented by shipping companies, the solutions which resulted in measurable effects. Following the author's observation of the instances of innovative solutions as well as his analysis of the ratings of innovativeness, the article aims to present the conclusions as for the specific kinds of activities which are indispensable to foster innovativeness in transport.

**Conclusions:** The conclusions derived from the author's analyses and observations show that logistic innovations in the Polish transport are of imitative character. It is essential to introduce new methods and modern business culture which are propitious to innovations. Transportation clusters may become the stimulus for innovativeness in TSL sector. The author, subsequently to his observation of instances of innovative solutions as well as his analysis of ratings of innovativeness, presents conclusions with reference to specific actions which should be taken in order to improve innovativeness in transport.

**Key words:** Innovations, Transport, Transport Innovations, Kaizen, Clusters.

## INTRODUCTION

Reports on innovativeness in Poland are disturbing. A report issued under the auspices of EU positions Poland as a country of very low level of innovativeness. The results of the European report are confirmed by the Global Innovation Index of 2012 where Poland is ranked as 44th and scores only 40,4 points out of total 100. In another rating, by Boston Consulting Group, which evaluated 50 most innovative businesses, there is not a single

Polish business entity. American firms excel and Asian businesses overshadow the European ones. The reasons for poor innovativeness in Poland are as follows: [Ratnicyn, 2012]

- Structure of the Polish economy does not foster innovativeness;
- Poor co-operation between businesses and academic centres (majority of innovative solutions are funded by academic centres in Poland while elsewhere they are financed by private sectors);

- Lack of technological clusters;
- Infrastructure deficiencies, especially evident in rail transport (poor line infrastructure, railway network modernization incommensurate with the needs);
- Low contribution of Polish organizations to foreign patents (there is an increasing tendency in Poland to buy foreign licences and patents, the level of national inventiveness looks bleak in the case of products and services);
- Conservativeness of entrepreneurs and managers.

Above factors, together with relatively low expenditures on innovativeness (several times lower than in other countries, e.g. 2 billion euro in Poland against nearly 68 billion euro in Germany) will make it impossible to improve Poland's position in innovativeness without some outright actions, changes in attitudes, promotion of innovative solutions or increased funds on research and development. There are no haulage contractors in these ratings.

The aim of the article is to present, on the basis of written sources, observation of ratings of innovativeness as well as the author's practical experience, the role and significance of the notion of innovativeness in transport. Further, following the author's own experience-based evaluation, the article presents instances of innovative solutions in transport, solutions which have resulted in measurable effects for the engaged companies.

## **INNOVATIONS IN TRANSPORT - ESSENTIAL ISSUES**

In transport, there is an urgent need for innovative changes which would improve its image and strengthen its market position. Rail transport in particular is in need of modification. However, as Burnewicz sees it [Burnewicz 2009], rail transport is an especially difficult area to implement innovations due to some institutional barriers of the sector, political character of decisions involving structural and technical modifications and, finally, insufficiency of investment funds in rail businesses. Burnewicz claims [Burnewicz 2009] that the smaller

a given sector and its market, the bigger reluctance to invest in innovations which would change its technological quality and prospects for development.

Business entities which operate in transport sector could be innovating companies. They are the entities which invest in new transportation technologies, in research and development, in new products, in refining of management processes and the processes of transportation services rendition, finally they invest in the organization of the transportation process. As Schumpeter [Olejniczuk-Merta 2013] sees it, innovation is neither a little improvement nor the process of implementing inventions. Innovation represents crucial changes in the service creation and processes which, as a matter of fact, have social context.

In every business we can find innovations in the product, the service as well as in the sphere of skills and activities. The more so, as the aim of a business is to win its own clientele, and, given that, as already mentioned by Drucker [Drucker 1994], in every business there are two most important functions - marketing and innovation. Innovations may arise from the needs of the market and the client. The need is one of the basic elements of marketing concept for running a business. The aim of an innovation is to effectively satisfy existing needs as well as to create new needs that will come from the clients' demands. As Gattorna [Gattorna 2013] writes "there is only one reliable way to introduce an innovation - to properly interpret the market and the client's needs". However, an innovation could be also represented by a new production line, streamlined sale system or more efficient personnel management. In transport, technical, technological and product innovations may become the means to outdo competitors. In other words, better and more efficient transportation services ought to be offered.

Transportation need is a derivative need and it is expressed by demand for transportation services generated by the economy. A characteristic feature of demand for transportation services are the clients' demanding expectations from the offered transportation service. Demands which affect the innovativeness of haulage contractors are such as, for instance, time of service delivery,

safety, reliability of services, comprehensiveness of the services range. To get to know these demands in their quality as well as quantity will allow a transportation business to meet the clients' expectations halfway and to assess the level of their satisfaction. Pursuit of satisfying transportation demands and clients' preferences are, in Niedzielski's view [Niedzielski 2003] the source of innovating processes in transportation businesses. A need becomes the primary source of innovation in transport. However, innovations in transport may be determined also by space, time, and dynamic character of a transportation service. This comes from the fact that in a dynamic transportation chain, the freight covers specific distance in a specific time between the despatch point and delivery point, sometimes in mixed technology system. In the course of freight handling, employees who represent haulage firms directly contact the dispatching party or the recipient and, subsequently, build up mutual relations and create the business image. In the present time of economic downturn and competition, one cannot think of establishing and developing a business without thinking about innovations or their implementation. Innovations include a variety of actions which concern market novelties such as streamlining of the existing transportation services or designing new transportation offers.

The idea of innovation itself has various definitions. According to Drucker [Drucker 2000], innovation is a specific tool for entrepreneurs by which they get an opportunity to undertake a new business activity or to render services. According to Oslo Manual [Ratnicyn] "innovativeness means the ability of a business to create and implement ideas which so far have not been in practical use". Innovations may also be interpreted as an instrument to exploit financial resources in order to obtain particular, profit-raising ideas. An innovation could also be understood as a change in what a business offers, a change in a business model or in a service, which should significantly improve the comfort of the service recipients. Kotler [Kotler at al. 2002] defines innovation as an idea, a product or a technology element which is developed and offered to clients who, in turn, perceive it as new or innovative.

Innovativeness in transport is understood as the actions which consist in the introduction of new solutions or processes concerning all changes which add to the increase in economic, technical, technological effectiveness of the business environment of transportation systems in order to maximize social effects and performance results of both the public and private sectors. [Centre for Transportation and Infrastructure Analysis 2012]. In Burnewicz's understanding [Burnewicz 2010] the need for innovation exists in the entire transportation system (country, city) as well as in particular branches and forms of transport. In his opinion, the effect of innovation in the former case should be the offer of a new generation of the service while in the latter case, the innovations are seen as cutting-edge transportation means, new generation of infrastructure, modern techniques of traffic control, new means of enhanced security, new ways of easing ecological and social nuisance. Impetuses for innovativeness in transport should derive from the policy of transport. Given the fact that transport policy aims at achieving well-balanced transport system (in technical, spacial, economic and environmental terms) with co-operation across Europe on a unified transport market, this policy should include the assumptions of transport innovativeness. Innovative transport policy, obviously, contributes towards well-balanced development of transport through proper creation, stimulation and financing of transport investment.

In logistic terms, logistic innovations for transport were presented in the action plan of European Union Commission for the logistics of freight transportation. They are, for instance, electronic freight transportation (e-Freight) and intelligent transportation systems (ITS) [European Commission 2007]. This has been confirmed by the White Paper of 2011 "Roadmap to a Single European Transport Area - Towards a competitive and resource efficient transport system" [European Commission 2011]. The White Paper focuses on technological innovations in, among others, the exploitation of transport networks and their safer and more reliable usage owing to information technology and communication systems.

There are proposals for innovations within the area of transport which attract attention. They are proposals for transport solutions within logistic supply chains, with the use of intermodal transport, e.g., intelligent container terminals, ultramodern bimodal systems or underground systems for the transportation of freight across cities. Among the innovations which consist in modernizing the process of a transportation service, there is one important example of activities whose ultimate aim is to ensure efficiency of the transportation process, to streamline the flow of freight and to overcome technical-operational barriers which arise during the entire process of, for example, the rail service rendition within the European network. Other examples concern electronic way of planning transportation routes and legal solutions to expedite the development of intermodal transport. The Strategy for Transport Development by 2020 [Ministry of Transport, Construction and Maritime Economy 2013] features innovative projects of technical and pro-ecological character. The most vital ones forecast redevelopment and assurance of inner interoperability of telematic systems which serve particular transport branches, such as ITS - road transport, ERTMS - rail transport, SESAR - air transport, VTMS - sea transport, and RIS - river transport.

## **INNOVATIVE SOLUTIONS IN TRANSPORT**

European Commission places a high value on innovativeness in transport. In the new planning-budget perspective for 2014-2020, the essential goal is to develop collaboration between science and business. However, this requires enhanced interest in such relation on both sides. The key objectives for research and innovations in transport are presented in chart 1. In Poland close co-operation of science and economic practice is a prerequisite for the growth of innovativeness and the implementation of inventions. As is being reflected in reports from the Central Statistical Office [Innovators in transport 2012, 2012] innovativeness in Polish haulage businesses is developing very slowly. This does not mean, though, that Poland does not have innovative solutions in transport. Quite the contrary, there are substantial solutions. Gattorna [Gattorna 2013] emphasises an important role of

innovations in raising efficiency in business operations. He puts forward the example of Michelin's e-tire, the device which resembles RFID that monitors the level of air pressure in tires. This in turn allows for optimum functioning of a tire and extends its durability. Wronka, for that matter, directs attention to innovative information practices in the intermodal transport [Wronka 2010] and adduces the international Brawo project which has been implemented by intermodal transport operators such as Kombiverkehr as well as rail hauliers from Germany, Austria and Italy. The project features advanced organizational and technological solutions for the development of intermodal transportation along the Brenner corridor. The following solutions are incorporated:

- coherent system of carriage management;
- multisystem train engines;
- radio control system for train engines;
- advanced system of managing information and the quality of services;
- prototypes of innovative technology for pocket carriages.

Substantial effects arose, for instance, punctuality increased by 90 %, transport records reliability achieved 100 %, number of carriage services grew by 16 %, clients' satisfaction with the quality of services rose. In transport it is required not only to initiate innovative activities but also to exploit marketing instruments for the support of innovative thinking and promotion of pro-innovative behaviour. Having analysed the two significant events representing Polish innovative solutions at the turn of 2012, one cannot disregard on-going changes. Centre for Transportation Innovations Foundation, in December 2012, organised I Forum for Transportation Innovations where 36 innovative projects were presented. The projects showed technological and financial solutions as well as organisation and management patterns for innovations. The projects' fields concerned road, rail, air, maritime and city transport. Events like that prove that there is a growing interest and capital in the Polish science and practice. All submitted projects were very interesting. One of them, as an example, is worth mentioning here [see: Innovators in Transport 2012, 2012]

- group purchase of transportation services (T -

scale). Innovativeness of the project consists in the full coordination of the realised processes in order to achieve well-balanced exploitation of all available transportation resources, i.e. coordination and consolidation of orders allow for optimisation of transportation costs which results from the economies of scale. The effects are 15 % costs savings on given lines. Subsequently, vehicles' empty mileage is reduced by 21 %. Another analysed case was the choice of innovative products in logistics in 2012. It appeared that among the awarded ones

there were products from the transport sector, products which allowed for the sector optimisation. However, the presented innovative products were not quite breakthrough but rather of derivative nature. To give an example, one of the rewarded logistic innovations in transport was DEGAmix - Dual Fuel System installation which consisted in the provision of two types of fuel for the DERVs, i.e. diesel oil ON and LPG. Such installation enables exploitation costs cut down to 10 - 15 %.

<p><b>Effective and ecologically balanced mobility</b></p> <ul style="list-style-type: none"> <li>- improved efficiency of vehicles - new generation of low-emission or no-emission vehicles;</li> <li>- alternative fuel;</li> <li>- intelligent transportation systems;</li> <li>- optimised management of demand;</li> </ul>	<p><b>Improved mobility</b></p> <ul style="list-style-type: none"> <li>- less traffic congestion;</li> <li>- easier availability;</li> <li>- integrated door-to-door transport and logistics;</li> <li>- enhanced intermodality and transport planning;</li> <li>- fewer road accidents;</li> <li>- better security for passengers and freight along the whole supply chain</li> </ul>
<p><b>Competitiveness of European transport systems</b></p> <ul style="list-style-type: none"> <li>- new generation of equipment and transportation concepts;</li> <li>- smarter steering systems;</li> <li>- more efficient production processes;</li> <li>- shorter development time</li> </ul>	<p><b>Support for policy-making</b></p> <ul style="list-style-type: none"> <li>- better understanding of socio-economic trends and perspectives;</li> <li>- supply of evidence-based data and analyses</li> </ul>

Source: Innovating for a competitive and resource-efficient transport system, Office for Official Publications of the European Union, Luxemburg, 2012.

Chart. 1. Goals in key areas of research and innovation in transport by 2020  
 Rys. 1. Cele w kluczowych obszarach badań inowacji w transporcie do 2020

The above short survey of innovations in transport justifies the claim that Polish scientists and practitioners are the authors of a variety of interesting solutions as regards information technology, engineering, construction and management. Consequently, a question arises why knowledge and practical experience in innovative developments in transport are being restrained. What are the reasons and what must be done in order to reverse the tendency?

## QUESTIONS ABOUT THE FUTURE OF INNOVATIVENESS IN TRANSPORT

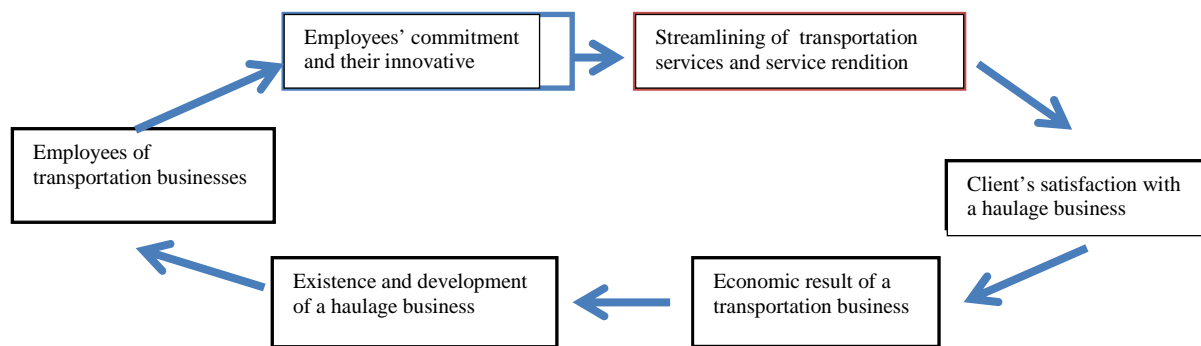
Undoubtedly, the mechanisms for ensuring development of transport in Poland are rooted in its adaptability to innovation-derived

changes. The ultimate goal of actions in transport should be to maximize the effects of innovativeness which result from the implementation of transportation projects. Moreover, while one is considering various innovations in transport, for example in process, technology or marketing, one must not forget about the organisational innovations which consist, for instance, in putting into practice either new organisation of running a haulage business or the incorporation of lean management in the course of running a transportation process. Taking advantage of the lean organisation, according to Womack and Jones [Womack and Jones 2003], helps to eradicate wastage and to optimize the processes which combine to create a transport service. The fundamental steps to implement lean organisation - conducive to innovations are: [Locher 2012]

- stability;
- standardization;
- visualization;
- continuous pursuit of excellence.

To manage a transportation process by the lean management principles aids the implementation of organisational innovations in transportation services together with the employment of the Kaizen method [Imai 2006, Dąbrowska 2011]. Kaizen is the method of continuous innovations. The essence of Kaizen philosophy in transportation services is

presented in chart 1. Such approach converges with the views presented by Bes and Kotler [F. Trias de Bes, P. Kotler 2013]. They understand innovativeness as the creation of company culture which allows for continuous stream of small, evolutionary innovations to be directed onto the market. The idea is to work out and sustain the culture of innovation both in the transport sector and all representing businesses as well as among the employees of all transportation businesses.



Source: Author's own source. Based on: M. Imai, Gemba Kaizen, MT Business 2007; and M. Dąbrowska: Innovations in the services sector, PARP 2011

Chart. 2. Essence of Kaizen in transportation services  
 Chart.. 2. Istota Kaizen w usługach transportowych

An important instrument which influences innovativeness in transportation services may also be clusters. Cluster may be defined as a network of neighbouring and often informally related organisations, which co-operate in the spheres where the achievement of synergy effects is plausible. Forefather of the concept of clusters was Porter [Porter 2001] for whom cluster meant a group of businesses, all located in one area, and related institutions functioning in a particular field, all connected by similarities and complementary to one another. [Ratajczak - Mrozek 2012]. Cluster may also be understood as the space and sector concentration of business entities which operate for the benefit of either economic development or of innovativeness of

scientific units or, finally, of entrepreneurs who run competing businesses or co-operate in the same or allied businesses interconnected within co-operation network. [ Booras, Tsagidis 2011]. It is essential for transport that the implementation of cluster solutions together with the established cluster structures ensure integration and collaboration of the business, science and public service. An example of such cluster initiative, crucial for innovativeness in transport, is "Interdisciplinary Partnership for the benefit of Innovative Development of Transport and Infrastructure". The objective of a cluster is to effectively obtain European and national funds to conduct research and developmental work, to promote innovation in the transport sector

and also, to establish positive business relations as regards the implementation of transport innovations. There are subject groups functioning within a cluster, such as management of transportation systems, modern intermodal transport and logistics, IT and ITS technology, innovative technologies in rail transport, modern management of mobility, development of pro-innovative competence and good practice in transport and infrastructure. In the case of transport services, managing aspects are important which aim at adequate motivation of employees, adequate management of human resources, and also, the management of knowledge which will inspire employees to come up with new initiatives and to make use of their underlying knowledge. One of the types of clusters are so called logistic clusters which were discussed by Sheffi [Sheffi 2012] and which provide logistic services such as, for instance, transportation and storage, reloading and forwarding, or some ancillary services, such as financial or insurance. They offer platform for business operations of innovative business entities such as Kiva Systems [Mountz 2013] which employs mobile robots to complete and pack ordered goods in warehouses.

## CONCLUSIONS

The idea of innovativeness in transport poses a challenge. To foster its further development, it requires the promotion of innovation culture through the employment of the following actions: [Antonowicz 2013]

- Formation of stable platforms and mechanisms for co-operation between public and private sectors, research and scientific units. These platforms may be in the forms of clusters which effect in synergy in establishing competitive edge. Clusters may constitute the strength of a region or a country;
- More efficient and effective exploitation of the European funds within the programme "Intelligent development". EU funds will constitute the primary financial source for transport projects;
- Co-operation between private and public sectors within public-private partnership;

- Comprehensive information activities which will support innovative behaviour. Set-up of the innovation cult as the drive for the development of businesses and the country.

Consequently, success of innovation in transport depends on the understanding of the transportation services market dynamics, co-operation, including the co-operation with those transport users who generate demand for transport services and set expectations for the offered services. Businesses which operate within the transport sector, in order to foster innovations, should also employ those elements which are derived from the research done by McKinsey and Company [Wessel, Christensen 2013, Fast 2013], i.e., the development of processes and functions connected with innovations, frequent reallocation of resources, improvement of technological and operative efficiency, support for the business culture oriented at the client's needs, and finally, drawing from the experience of other business sectors as well as from foreign businesses.

The question of logistic innovation in the Polish transport is a strategic issue. The indication of the sources of innovation as well as the tool which, undoubtedly, is the first Polish cluster of innovativeness in transport, logistics and infrastructure, determines the novelty of the approach to the issue of innovativeness. By means of this article, the author has shown that to realise the client's needs by a business is a prerequisite for changes in transportation services; moreover, that the organizational innovations lead to changes in the business model; finally, the author has determined the kinds of actions which result in the achievement of the culture of innovativeness in the Polish transport.

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## INOWACJE LOGISTYCZNE W TRANSPORCIE

**STRESZCZENIE. Wstęp:** Artykuł dotyczy problematyki innowacji logistycznych w transporcie. Przedstawiono w nim podstawy zagadnienia innowacji logistycznych w transporcie wraz z przykładami konkretnych innowacji. Wskazano w nim na rolę potrzeb klienta w innowacjach transportowych. Do najistotniejszych postulatów mających wpływ na innowacyjność przedsiębiorstw transportowych na podstawie doświadczeń i publikacji naukowych zaliczono czas transportu, bezpieczeństwo, niezawodność usług, kompleksowość oferty usługowej. W oparciu o analizę problematyki zaproponowano jako przydatną dla rozwoju transportu koncepcję ciągłych innowacji w oparciu o metodę Kaizen i Lean. Management. Wskazano na potencjał klastrów, jako źródła innowacyjności logistycznej w transporcie.

**Metody:** Dla wyjaśnienia problematyki zastosowano analizę literaturową zagadnienia innowacyjności, ocenę rankingów innowacyjności oraz analizę przykładów nagrodzonych rozwiązań innowacyjnych w transporcie w oparciu o metodę obserwacji własnej i ocenę wynikającą z uczestnictwa w wyborze rozwiązań innowacyjnych w transporcie. Rolę innowacji w praktyce działalności gospodarczej uzasadniono także w oparciu o analizę dokumentów o charakterze strategicznym np. Białej Księgi z 2011 r. oraz Strategii Rozwoju Transportu do 2020 r. przyjętej przez Rząd Polski w 2013 r.

**Cel:** Celem artykułu było przedstawienie roli i znaczenia problematyki innowacji logistycznych w transporcie oraz wskazanie praktycznych przykładów logistycznych rozwiązań innowacyjnych w transporcie skutkujących wymiernymi efektami dla przedsiębiorstw je wdrażających. Na podstawie przeprowadzonych obserwacji przykładów rozwiązań innowacyjnych i analiz rankingów innowacyjności przedstawianie wniosków w zakresie konkretnych rodzajów działań niezbędnych do poprawy innowacyjności w transporcie.

**Wnioski:** Wynikające z analiz i obserwacji wnioski wskazują, iż innowacje logistyczne w polskim transporcie mają raczej charakter odtwórczy. Niezbędne jest wprowadzanie nowych metod i kultury organizacyjnej sprzyjającej innowacjom. Klastry transportowe mogą stanowić instrument pobudzający rozwój innowacji w sektorze TSL. Autor na podstawie przeprowadzonych obserwacji przykładów rozwiązań innowacyjnych i analiz rankingów innowacyjności przedstawiania wnioski w zakresie konkretnych rodzajów działań niezbędnych do poprawy innowacyjności w transporcie..

**Słowa kluczowe:** inowacje, transport, inowacje w transporcie, Kaizen, klastry.

## INNOVATIVE LOGISTIKLÖSUNGEN IM TRANSPORT

**ZUSAMMENFASSUNG. Einleitung:** Der Beitrag bezieht sich auf die Problematik innovativer Logistiklösungen im Transport. In ihm wurden die grundlegenden Fragestellungen der innovativen Logistiklösungen für den Transport samt den Beispielen von konkreten Einführungen dargestellt. Dabei hat man auf die Rolle der Kundenbedürfnisse bei den transportmäßigen Einführungen hingewiesen. Zu den wesentlichsten Postulaten, die einen Einfluss auf die innovativen Fähigkeiten von Transportunternehmen ausüben, zählte man aufgrund der gewonnenen Erfahrungen und wissenschaftlichen Veröffentlichungen: Transportzeit, Sicherheit, Zuverlässigkeit von Dienstleistungen, Komplexität des Dienstleistungsangebotes. Gestützt auf die Analyse der Problematik wurde ein für die Entwicklung des Transportes brauchbares Konzept der permanenten innovativen Logistiklösungen gestützt auf die Methoden von Kaizen i Lean Management vorgeschlagen. Dabei hat man auf das Potenzial der Cluster als Quellen der innovativen Logistik im Transport hingewiesen.

**Methoden:** Für die Erläuterung der Problematik hat man die Analyse der Gegenstandsliteratur und Beurteilung von innovativen Rankings, sowie die Analyse der Beispiele von preisgekrönten Innovationslösungen im Transport in Anspruch genommen. Die Ermittlung der besten Lösungen erfolgte aufgrund der Selbstwahrnehmung und der auf die Teilnahme an der Auswahl der innovativen Lösungen für den Transport schließenden Beurteilung der Einführungen. Die Rolle der innovativen Einführungen in der Wirtschaftspraxis auch hat man in Anlehnung an die Analyse der Dokumente vom strategischen Charakter wie zum Beispiel an die Analyse des Weißen Buches aus dem Jahre 2011 und der von der polnischen Regierung 2013 angenommenen Strategie der Transportentwicklung bis 2020 begründet.

**Ziel:** Das Ziel des Beitrags war es, die Rolle und die Bedeutung der Problematik der innovativen Logistiklösungen für den Transport darzustellen sowie auf die praktischen Beispiele von innovativen Einführungen im Transport, die für die einführenden Unternehmen mit brauchbaren Effekten resultiert haben, hinzuweisen. Auf Grund der durchgeführten Wahrnehmung der Beispiele von innovativen Lösungen und der Analysen von innovativen Rankings galt es,

die Ergebnisse in Form von konkreten, für die Verbesserung der innovativen Fähigkeiten im Transport nötigen Aktivitäten zu projizieren.

**Ergebnisse:** Die von den Analysen und Wahrnehmungen hervorgehenden Schlussfolgerungen weisen darauf hin, dass die innovativen Lösungen im polnischen Transportwesen einen eher nachbildenden Charakter besitzen. Daher ist es unentbehrlich, neue Methoden und die neue, den innovativen Logistiklösungen entgegnetretende Organisationskultur einzuführen. Die Transport-Cluster können dabei als das die Entwicklung des innovativen Potenzials im TSL-Sektor anspornendes Instrument in Funktion treten. Der Autor projiziert auf Grund der selbst durchgeführten Wahrnehmung der Beispiele von innovativen Lösungen und der Analysen von innovativen Rankings die Ergebnisse in Form der konkreten, für die Verbesserung der innovativen Fähigkeiten im Transport nötigen Aktivitäten und Einführungen.

**Codewörter:** innovative Lösungen, Transport, innovative Logistiklösungen im Transport, Kaizen, Cluster.

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