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### Classification of logistics innovation Tomsk Polytechnic University

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#### Abstract

Nowadays in the age of globalization, integration and internationalization innovations are determined as a key competitive advantage of a country. The paper presents conception of the innovation and logistics innovation. Logistic innovation is, first of all, a practically implemented innovative business idea, as well as all the processes connected with its formation and realization. The paper discloses goals and objectives of logistics innovation. Classification of logistics innovations was made by various researchers, but all these classifications have no integrity. Therefore it is necessary to develop a generalized classification of logistics innovation. Based on different studies, theories, methodologies and systematization of logistics innovations the author proposes a generalized classification of logistics innovation.

*Keywords:* logistics innovation, classification of innovations, directions of innovative logistic activities

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#### 1. Introduction

A more detailed study of innovation is necessary for effective management of logistics activities. There are many definitions of innovation. Various scientists interpret the concept "innovation" in different ways. Fundamentals of the theory of innovation were laid by D. Ricardo and A. Smith. The biggest contribution to the understanding of the role of innovation in economy has been made by J. Schumpeter. Among the most famous scientists who gave definitions of "innovation" were N. Machiavelli, N. Monchy, E. Rogers, I. Perlaki, E. Mansfield, B. Hartmann, P. Foster, B. Twiss, B. Santo, V. Kolosov, H. Reschke, I. Tукkel, S. Ilyenkova, V. Burkov, V. Voropayev, V. Shapiro.

In general, innovation is a process of scientific and technological activities, which are the results of innovative, technological, organizational or managerial character. Innovation is always connected with progress, and its necessary condition is implementation of innovation in practical activities. As a result, innovation assumes receipt of commercial benefit. That is why, not only the idea of creation of a new product is necessary, but also its practical implementation to meet the needs of the client, whose main purpose is to make profit [4, 6, 8].

Logistics innovation is a primarily innovative idea in the sphere of logistics. In the generalized sense this is the idea used for the organization of a new direction in the activities of already existing company or a new one. Most often, an innovative idea is directed by creation of goods

and services which are subject to commercialization and make a profit, because a new model is based on the idea which indeed brings its innovativeness [1, 7].

Innovations in logistics are seen as ways to develop a more rational (optimal) procedures and operations on the basis of logistic processes or as use of innovations in logistics in the form of achievements of scientific and technical progress in the relation on the improvement and modernization of vehicles, warehouse and handling machinery, packaging and prepackaging machinery, new types of packaging materials etc. [3].

There are the following purposes of innovation: decrease in labor costs, reducing material costs, and decrease in finance costs. Thus as a result of implementation of certain innovations only one goal, or two, or the entire set of goals can be realized meaning simultaneous reducing of three kinds of logistics costs. Key objectives for companies engaged in logistics activities are: introduction of control systems; cost optimization; creation of objects logistics infrastructure; increase the level of customer service [3].

It is necessary to be able to distinguish innovation from insignificant modifications in products and engineering procedures; minor technical or external changes in the products leaving the same design of the product by expanding the range of products through the development of production unreleased before, but already well-known products on the market for the purpose of satisfaction of the current demand and increase in the income of the company [2].

## 2. Materials and methods

It is necessary to consider the most important signs which are the cornerstone of known classifications. Most of them are based on the typology that is the scientific method, which is based on the dismemberment of objects and their grouping with the help of the generalized model. Groups of logistic innovations on various bases shall not only concretize structure of the studied object, innovative line items, but also to identify links and relations between different types of logistics innovation.

In modern literature it is possible to encounter a small amount of various approaches to classification of logistic innovations among which much attention deserve the studies of Russian scientists such as O. Rykalina, V.V. Scherbakov and D.P. Ivanova.

## 3. Results

The classification of logistic innovation based on identification of the directions of innovative logistic activities and objects of its application is presented in Table 1.

Table 1 – Classification of logistics innovation (Source: compiled by authors in [5, 7])

Classification sign	Types of logistic innovations
Logistics areas	<ul style="list-style-type: none"> <li>• purchasing activity;</li> <li>• warehousing;</li> <li>• transportation management;</li> <li>• resource allocation in production;</li> <li>• industrial process;</li> <li>• inventory;</li> <li>• sales activities.</li> </ul>

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Group of distribution	<ul style="list-style-type: none"> <li>• functional logistic chains – in logistics subsystems;</li> <li>• micrologistic chains – in enterprises and organizations;</li> <li>• macrologistic chains – combine subjects of managing of various activities – production of goods and service trade.</li> </ul>
The scale of application determines a place of use of logistic innovations	<ul style="list-style-type: none"> <li>• local – in a particular enterprise, company or organization;</li> <li>• sectoral – in enterprises, companies and organizations in the industry, functioning in the total goods market or the market of services;</li> <li>• intersectoral – unites participants of supply chains of various industries of production of goods and service trade – participants of these supply chains function in various markets, but are united by the common goals and tasks connected with release of finished goods;</li> <li>• system-wide – use developments in the area of logistics innovation as the basic of conceptual positions and approaches that allow to realize innovations virtually in any sphere of logistics activities.</li> </ul>
Level of use of logistic innovations	<ul style="list-style-type: none"> <li>• operational;</li> <li>• procedural;</li> <li>• functional.</li> </ul>
Type of business processes	<ul style="list-style-type: none"> <li>• technological – warehouse, cargo-handling, transport;</li> <li>• organizational – principles and methods of technological processes;</li> <li>• managerial – control actions of the organizational and technological processes.</li> </ul>
Role in reproduction process	<ul style="list-style-type: none"> <li>• basic process innovations forming large technological and management systems;</li> <li>• supplementing technological and developing to the existing technologies.</li> </ul>
Innovative transformations in business	<ul style="list-style-type: none"> <li>• basis, or forming new spheres of logistic activity;</li> <li>• developing, interpreting basic innovations;</li> <li>• pseudo-innovations introducing minor changes, but maintaining viability of business.</li> </ul>
Direction of the impact on the controlled process	<ul style="list-style-type: none"> <li>• expanding aimed at deeper penetration into various sectors and at the markets of available basic innovations;</li> <li>• rationalizing, identical to the importance the developing;</li> <li>• replacing, providing replacement of one (old) technologies by others (new), but carrying out similar functions.</li> </ul>
Character of response to the competitive environment	<ul style="list-style-type: none"> <li>• pre-active – providing leader's positions in business;</li> <li>• reactive – supported the position of the follower.</li> </ul>
Way of legal protection	<ul style="list-style-type: none"> <li>• protected by law;</li> <li>• protected under the contract according to the stipulated parties conditions confidentiality.</li> </ul>

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#### 4. Conclusion

Classification and typology of innovation can be made in various schemes, the principles of grouping, methods of organization and classification features. Classification of logistic

innovations allows to say that logistic innovations in various scales participate in all types of business processes and are provided in all areas of logistics.

An attempt is made to generalize the set of features by which to classify logistics innovation that allows you to develop uniform criteria for evaluating their performance. The proposed variant of the generalized classification of logistics innovation allows a better focus among the existing logistics innovation.

Value of the developed classification:

- It covers a wider range of diverse logistics innovations and characterizes them more fully;
- It has a fairly significant practical importance, since it has the potential to provide a detailed understanding of the characteristics of progressive innovations.

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