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International Scientific Conference**AXIOMATICAL INFORMATION-TECHNOLOGY MODEL OF
INNOVATIVE LOGISTICS**Leontiev Rudolf Georgievich (a), Barchukov Alexey Valeryevich (b)*
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**Abstract**

There are concentrated definitions of basic logistics concept for administration of economical systems in its fifth hypostasis: business activity, science, administration function (management), academic subject area and educational major formulated in this article. The first definition of logistics as sphere of business activity defined as key, that's why on its basis for more rigorously scientifically grounded of its understanding (logistics) content there are several author axioms arising under it definition represented in this article. These axioms taken as a whole are designated for more tight adjustment of bounds of logistics functioning as a sphere of business activity of autonomous economical entity, that means more well-defined fixing its economical and physical sense. Its already determined that there were author axioms represented in this article or decisive thesis, *ex ante*, must derive from opinions of famous specialists, however for confirming such incontestability there are additional justifications described in accordance with discussion procedures. In such a way, axiomatically information-technology model of logistics represented by a formulation of its definition and several axioms of its manifest and enforcement. Incorporating in the sphere of logistics new reinterpretations and terms should be arranged by corresponding scientific rationale, broad approbation of this rationale, general recognition of specialists and only after it by inclusion into textbooks.

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1. Introduction

It is well-known that information technologies are used for performance improvement of business-logistics, whereas fulfils two useful functions. First of all, by using information technology a process of order receipt become faster, processing and selection of goods, its delivery and invoices issue for payment. Secondly, application of information technologies has a quite positively impact on planning and assess alternatives of new logistics solutions. Unfortunately, even widely known specialists of information technology in business sphere (Bauersoks & Kloss, 2017; Böse, 2011; Johnson et al., 2016; Pavar, 2005; Trosman, 2007) often indisposed to formulate exhaustive concentrated interpretation of logistics as scientific category or academic term.

2. Problem Statement

Meanwhile among segmental regulations, taken from projects (Abara et al., 2017; Bubnova & Levin, 2017; Monios, 2017; Sergeev, 2019; Sergeev, 2016), it is possible, in the opinion of current article authors, to formulate following quite acceptable concentrated definition of basic for administration of economical concept systems (term) as logistics, moreover in fifths of its hypostasis, as business activity, science, administration function (management), academic subject and major.

3. Research Questions

First of all, **logistics as an economic activity (business logistics)** is a specific part (one of the spheres, along with marketing, production, innovation, etc.) of economic activity (complex production function) of an industrial enterprise (economic entity, economic entity, business unit), carried out by him in whole or partially (the rest can be carried out on his behalf drawn up by the relevant contract by other enterprises). It is aimed at performing a single process for the physical movement in time and space of the materials at the disposal of this industrial enterprise (to ensure the functioning of its own material flow) - from the supply of raw materials and materials to the delivery of the manufactured product to the final product to the consumer, that is, through all stages of the production cycle (supply, production, sales).

Then, **logistics as management or management** is an integrated (enlarged) function of managing logistics activities or management of logistics activities (marketing management or marketing management). The role status of logistics as an integrated production function of an industrial enterprise must necessarily be determined by the efficiency of a single (integrated) process of its (logistics) implementation. The criterion for such efficiency is the minimum total costs for the implementation of the entire complex of logistics operations as a sphere of economic activity.

Further, **logistics as a science** is a separate branch of managerial, economic, technical and other knowledge about the patterns of development of such an objective reality as logistics activity (the science of marketing activities, the science of innovation management, etc.).

At the same time, **logistics as an academic (educational) discipline** is a set of generally recognized knowledge in the field of management of logistics activities or management of logistics activities.

And, finally, **logistics as a specialty** is a set of generally recognized knowledge, skills and abilities acquired by a specialist (logistics manager) in the course of education and providing a certain level of qualification in the field of logistics management or management of logistics activities.

4. Purpose of the Study

The first definition of logistics as a sphere of economic activity is key and, therefore, on its basis, for a more rigorous scientifically substantiated understanding of its (logistics) essence, it is necessary, according to the authors of this article, to formulate several axioms arising from this definition. Together, these axioms should more strictly clarify the boundaries of manifestation and functioning) of logistics as a sphere of economic activity of an independent economic entity, that is, more clearly fix its economic (and physical) meaning.

5. Research Methods

Although the author's axioms or indisputable provisions presented below, a priori, should follow from the opinions of well-known experts, here it is necessary in the order of presenting additional justifications:

a) **axiom 1.** The following explanations can serve as confirmation of the validity of this axiom:

– specialists in the management of economic systems know that any area of general economic activity (be it logistics, marketing, innovation, personnel management, production itself, and financial activity), a priori, must be accompanied by appropriate information technology and financial support (streams). Therefore, as it is meaningless to talk about "management of information and financial marketing (production, innovation)", it is also pointless to talk about "information and financial logistics". That is, in logistics, financial and information flows exist, but information and financial logistics as spheres of economic (industrial) activity should not be;

– speaking about the "flow" of services, first of all, it is necessary to take into account their differences from material products (goods). If, for example, according to Bauersoks and Kloss (2017) to understand logistics as the strategic management of the movement and storage of goods and materials, it was already noted above that in the physical sense, the movement of services cannot occur, due to the inseparability of the place of production of services from the place of their consumption. Obviously, realizing this, leading foreign experts in their works prefer not to justify the existence of "service flows" and the connection with them logistics;

b) **axiom 2.** It should be noted here that the last statement of Bauersoks and Kloss (2017) to what extent do they represent their opinion that even global logistics (not to mention macro-, meso- and regional logistics) should be carried out only in the interests of a particular firm (an independent economic, business or market entity). In circumstances, when agricultural products, bypassing the food and other sectors of the processing industry, enter the end-use market, an agricultural enterprise can also be the subject of logistics activities;

c) **axiom 3.** The interpenetration of these complex management functions is not excluded, but, in principle, marketing and logistics (in particular) are functions of management of various spheres of

economic activity of an industrial enterprise, at the same time, constituting a complex of specific (special, specific) functions of general management of industrial enterprises. So, a well-known specialist from the Massachusetts Institute of Technology (USA) highlighted the known possible contradictions between the tasks of logistics managers and the tasks of marketers of a certain industrial enterprise;

d) **axiom 4.** The justification for the advancement of this axiom can be the following circumstances:

– from the point of view of managers of an industrial enterprise as a subject of logistic activity, the "transportation" of materials (goods) belonging to it, carried out by a third-party transport organization within the framework of this activity, is considered a logistic operation. For the management of the specified transport organization, it is simply the transportation of cargo belonging to the client, or freight transportation under the corresponding agreement with the customer. To complete the picture, it should be recognized that these arguments are also valid for any other logistic operation of an industrial enterprise, for example, temporary "storage" of its own material (commodity) resources in someone else's warehouse;

– and three or six "necessary" goals of Pavar (2005) (the right goods, in the right place, at the right time, at the right price, in the right quantity, the right quality) and eight "necessary things" by Bauersoks and Kloss (2017) (the right product, in the right quality, in the right quantity, in the right place, at the right time, in the right form, in the right packaging and with the right information) can be qualified as, although truncated (incomplete), but all same, structural and motivational information technology models of logistics;

– for developing a complete structural-motivational information technology model of logistics of an industrial enterprise (that is, a model of the structure of motives or goals of logistics), according to the authors of this work, it is necessary to designate the elements that characterize its (logistics) first supply (purchasing) stage. This will make it possible to build an integrated structural-motivational information technology model of logistics as an integrated production function or an enlarged management function, which (the model) will allow, albeit tentatively, but more fully to present its (logistics) characteristics;

e) **axiom 5.** Indeed, if there are no aggregate costs, then there is no logistics. It should be noted here that *the structural-motivational information technology model of logistics* in general, as well as each element of this model in particular, proposed in the explanations to the previous (4th) axiom, means their focus on ensuring its (logistics) efficiency, that is, to achieve a minimum of the corresponding costs. Therefore, this model can be qualified as a kind of *information-technology model of the economic efficiency of the logistics of an industrial enterprise*;

f) **axiom 6.** If a term, phrase, phenomenon and event, attributed, in someone's opinion, to logistics, do not correspond to at least one element of the definition of its (logistics) concept or at least some one axiom of its manifestation and implementation, then they (term, etc.) cannot be recognized as belonging to the specified branch (area) of knowledge.

6. Findings

So, the above scattered provisions from fundamental works (Bauersoks & Kloss, 2017; Böse, 2011; Johnson et al., 2016; Pavar, 2005; Trosman, 2007), and the definition developed on their basis by the authors of this article, allow us to formulate the following axioms for the manifestation and existence of logistics as an economic activity:

1) logistics is carried out only in relation to the material (commodity) flow, that is, the object of logistic activity is the material (material) or commodity (and no other) flow;

2) the subject of initiation, motivation, financing (bearing) costs and implementation (management) of logistic activities in relation to their own material resources in their own interests and by their own forces (or by the forces of other organizations) can only be some kind of industrial enterprise acting as an independent economic subject (business entity, business unit, market entity);

3) logistics – it is one of the production functions or one of the specific (special, specific) enlarged (complex) management functions of a particular industrial enterprise, along with other specific functions of general management: marketing management, production management, R&D management (innovation or innovation), financial management and personnel management;

4) logistics is a sphere of economic activity, covering all operations of physical movement in space and movement in time at all the main stages of the enterprise (supply, production and sales) and implements a complex function. Only within the framework of specific logistics and as elements of specific logistics, its main stages (supply, production and sales) and all operations of these stages (orders, transportation, information exchange, inventory management, warehousing, cargo handling, packaging, etc.) can be regarded as logistic. Outside the framework of specific logistics, these stages and operations should not be designated as logistic;

5) logistics can only be effective, that is, it must ensure a minimum of costs (costs) for the entire range of operations for each supply chain based on the principle of a compromise of these costs. If such a minimum is not ensured, then the corresponding activity or its management cannot be considered logistic;

6) area of economic activity can be recognized as logistic if it meets all, without exception, the elements of this basic definition of logistics and all, without exception, these conditions (restrictions) of its manifestation and existence.

7. Conclusion

Thus, the axiomatic information technology model of logistics is represented by the formulation of the definition of its concept and several axioms of its manifestation and implementation.

The inclusion of new interpretations and new terms in the field of logistics should be provided with appropriate scientific justification, wide testing of this justification, universal recognition of specialists and only then introduction into textbooks.

Of course, one can doubt the absolute fairness or universality of the version of such a model presented in this article, in the correct interpretation by the authors of this work and the version of the model of conclusions and inferences of well-known foreign experts, but the fact that there is an objective need to develop it for use in domestic and foreign practice cannot raise any doubts. At least, there will be something to start from with a strict scientific substantiation of the formulation of new (not corresponding to the proposed axiomatic information technology model of logistics) concepts of logistics, with their sufficiently thorough verification, testing and general recognition and, what is especially important for domestic practice, when making qualified decisions on the publication (reprint) of the corresponding educational literature. Moreover, the development of sufficiently substantiated new, more advanced versions of such a model, based on other recognized scientific schools in the world, is not excluded.

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