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DEVELOPMENT OF THE LOGISTICAL SUPPORT MECHANISM FOR THE AIRLINE'S INNOVATION ACTIVITY ON THE MARKET OF AIR TRANSPORT SERVICES

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ABSTRACT

In this article the key aspects of logistical support of the airline's innovation activity on the market of air transport services have been defined, the structure of the airline's innovation system, logistics approach to managing the innovation activity of an airline enterprise have been considered and the main objectives of logistical activity in the context of innovation activity support of airlines have been clarified. The importance and peculiarities of logistical support of the airline's innovation activity as an innovation flow control system have been studied. The algorithm of formation of the logistical support mechanism for the airline's innovation activity has

been elaborated and specified. The objectives tree for improving the efficiency of logistical support of the airline's innovation activity has been created.

Key words: innovation activity, airline, logistical support, flows, mechanism

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1. INTRODUCTION

In the current dynamic environment of business activities lead by national and international companies and to ensure stable dynamic growth, the issue of innovation model for the development of business structures becomes particularly topical. Development of domestic and international air transport market takes place under the influence of the dynamic conjuncture forming factors. At the same time there is an increase in globalization of international transportation market within the global and strategic alliance of airline carriers and harsh competition among the companies for the place on the market. Therefore, there is the necessity in organization of search, preparation and implementation of innovations (novelties) that will ensure the increase of competitive ability, innovation activity and efficiency of airline companies on the market of air transport services.

Theory and practice of innovation activity requires sprawling of its scientific base for its progressive growth. This requirement can be satisfied by means of logistics theoretic and methodological provisions and tools. In that context there is mutual and thorough enrichment of two scientific fields.

Logistical support plays an important role in increasing innovation activity of airlines operation. At the same time logistics ensures the accordance of innovations with the principles of logistical control, optimizes innovation activity by achieving logistical efficiency, improves functional interconnections inside organizational structure of airlines and develops business collaboration with all the participants of logistics chain of airlines.

International airlines in order to increase the area of providing their international air operation services and to strengthen and keep competitive positions on the global market of air transportation are oriented to development and implementation of technical, technological, administrative, social and economic, information and marketing innovations together with the total increase of innovation activity and accumulation of innovation potential on the air transportation market.

Logistical support of innovation activity and development of the logistical support mechanism for the airline's innovation activity on the market air transport services guarantee high level of competitive ability for companies and effective satisfaction of consumer market requirements. Considering the stated above, logistics appears to be a kind of imperative for the development of airline innovation activity.

All told above creates organizational and economic base for increasing effectiveness of airline operations, ensures their resistance to external bifurcations of the market environment and becomes the key basis for the rise of competitiveness and profitability on the international market of air transportation.

2. ANALYSIS OF THE LAST INVESTIGATIONS

Studies and investigations of innovation activity mechanisms of companies and formation of the mechanism of logistical processes during the implementation of innovation projects in the international scientific literature have been carried out by scientists and experts on the international level, in particular: Björkdahl, J., Holmén, M. (2013), Bohlman, *J*., Kletzel J., Terry B. (2017), Brager B. L. (2019), Chesbrough, H. (2010), Hammoud, G. A., Tawfik, H. F., Elseyoufi, T. S. (2017), Giesen, E., Berman, S. J., Bell, R., Blitz, A. (2007), Kyryk, O. A. (2015), Lendel V., Moravcíkova D., Latka M. (2017), Riggs, H. E. (1983), Tere J. (2011), etc.

Bohlman, *J*., Kletzel, J. and Terry, B. (2017) consider innovation logistics as an important component of economic activities of a company within the management process. In that context practical implementation of logistical innovations requires investigation and multiple use of theoretical basis of innovation logistics together with complex application of contemporary approach to the process of introduction of innovations into the business processes of companies.

Topical issues on logistical support and maintenance of innovation activity are revealed in the scientific work of Kosenko, V. and Milash, L. (2016). The scientists have determined the key factors that show the expediency of logistical support for innovation potential of companies under conditions of changing market environment; they have highlighted the important role of information technologies in the process of innovation development and implementation.

At the same time Kudriavtseva, S. (2017) determines the importance of logistic component in managing innovation processes of airlines as the tool of providing well-coordinated administration of innovation projects implementation.

Smerichevskyi, S. (2017) in his scientific work suggests and proves the multipurpose technology of business-modeling for increasing the efficiency of business processes in the logistical activity of low-cost airline companies – Business model canvas. In this work the attention is drawn to the fact that this concept allows to build the most suitable business model with the help of which all necessary managerial decision will be made in future. These decisions will help to ensure stability and competitiveness of the company.

It is important to pay attention to the issue of methodological approach to the efficiency evaluation of innovative processes in logistical activity of the enterprise (Kryvovyazyuk, I., Volynchuk, Y., Pushkarchuk, I., 2015) and problems in application of information technologies for managing enterprise's logistics system (Kryvovyazyuk, I. V. and Kulyk, Y. M., 2013).

Highly appreciating the contribution of scientists and experts in the development of theoretical bases of logistic management and innovation systems of companies it should be mentioned that there is a number of methodological and scientifically applied aspects that refer to operation and development of airline carriers, insufficient revealing of interconnection between issues under investigation and modern tendencies in the development of air transportation market, between the investigation of logistical support and creation of means to activate innovation activity of air entities.

3. PROBLEM DEFINITION

The object of this scientific study lies in multi-method research on the logistical support mechanisms for the airline's innovation activity on the market of air transportation services in the age of economic globalization and volatile business environment.

4. RESULTS AND DISCUSSION

Logistical support of innovation activity is aimed to increase the management level of innovation processes in order to improve customer service, to increase the efficiency of flow processes and to reduce expenses for their implementation, which will ensure enhancement of economic efficiency of the airline's activity and its competitiveness.

In such a case the optimal control of the airline's innovation activity should be based on the logistic concept that provides integration of all possible processes into the enterprise – from raw materials supply to introduction of derived innovation product to consumers (clients).

Strong interrelation of logistics with innovation activity of modern companies has become evident in the following facts:

- firstly, implementation of logistical instruments to optimize the management of resources, materials and concurrent flows, to optimize the control over logistic systems and processes applied in innovation activity, is aimed at maintaining effectiveness of innovation projects implemented by a company.
- secondly, logistical activity and logistic system of a modern company, as any other activity, requires innovation approaches that will increase competitiveness and ensure gradual development of a company in the dynamic market environment.

Thus, to guarantee the synergetic effect while using different operational capabilities of modern airlines aimed at achievement of the highest positive result from their innovation activity, logistic system should be organized in a proper way. In that context, the logistical approach allows efficient managing of numerous flows that are generated in the process of the airline's innovation activity as well as simulating the configuration of innovation system according to main and concurrent flows.

Making program and strategic ways of expansion of an airline on the market of air transportation services and developing organizational and economic mechanisms to manage different business processes, the set of innovations is considered to be a one unit that is presented as innovation system of an airline entity (Figure 1).

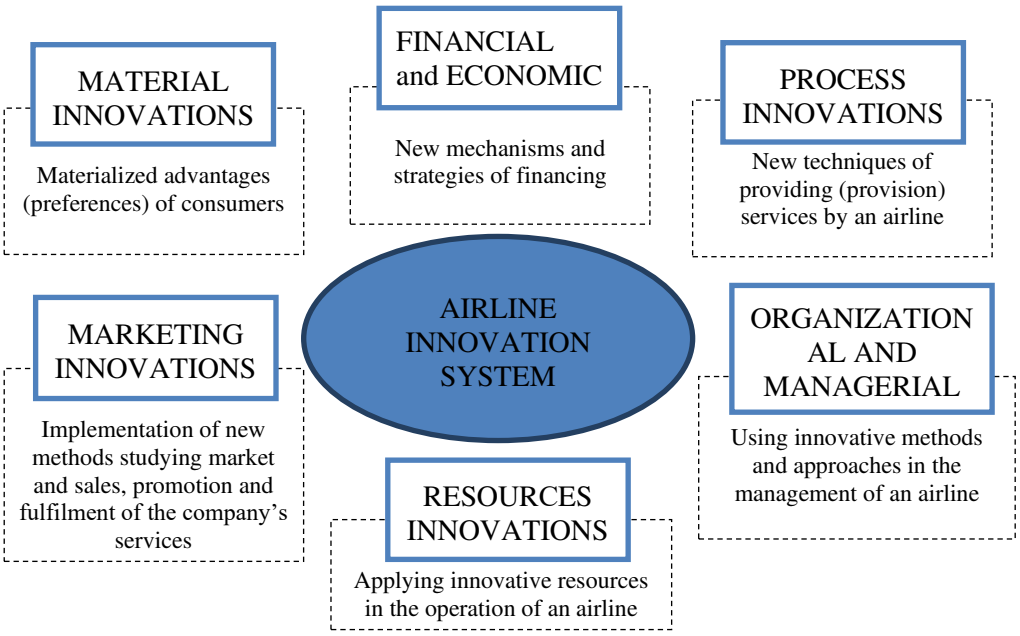

Figure 1 Structure of the airline's innovation system (Developed by authors)

Systemic approach to the airline's innovation activity allows to claim that it is a block system, where innovation activity management, in the context of its main business processes – marketing, organizational and managerial, operational, product, financial and economic – becomes an important component of this block system.

From the point of view of the author of this study, logistical support of the airline's innovation activity should be treated as management system of innovation flow. The importance of logistical support is determined by the fact that it is present at every step of innovation chain – from the moment when the innovation idea appears to the moment when the innovation product has been produced or when innovation services have been delivered to the ultimate customer. Implementation of innovations requires material, financial, informational and workforce flows, while all expenditure operations need material, financial and time resources.

In terms of brand value, the largest passenger airlines include Lufthansa, Emirates and Delta Air Lines. The latter is also the leading airline in terms of passenger traffic, while Emirates leads the list of cargo carriers, based on freight mileage. Ryanair and Southwest Airlines are the main players in the low-cost category, which is attracting a growing customer base (Statista, 2020).

Following global tendencies in innovation development of airlines there is a necessity for financing of investments in airline capital assets, and for increasing financing of innovation projects from general amount of investments. This increased financing is crucial for implementation of the projects oriented to develop additional services on board and on-line.

The principal directions of innovation development of airlines include information systems that will help in better recognizing client demands and in providing them with personal services. Moreover, they will help to modernize aircraft fleet, improve aircraft cabins, technologically upgrade flight safety, provide high quality passenger service – from tickets booking to baggage claim at the destination point.

Thus, in the process of organization of innovation system, an airline can be imagined as a structure system that has interconnected input and output flows (logistic concept). Logistic approach to the airline's innovation activity management is thought to be conceptual, because basically it appears to be a unity of ways how to improve the airline's activity by means of rationalization in management of financial, material, information and service flows during the process of innovation projects implementation. The key components of this concept are the following:

- implementation of systemacity approaches to managerial tasks in the field of innovations;
- management based on rationalization of information flows (information that comes from external and internal environment);
- to make decisions based on economic compromises and take into account interests of all participants involved in the innovation process;
- cost optimization throughout the logistical chain of innovation activity (administration of all material flow expenses from the initial to the final stage of innovation consumption);
- to treat logistics as a factor increasing airline competitiveness in variable conditions of external environment.

Investigating tendencies in the development of the logistical support mechanism for the airline's innovation activity on the market of air transport services it is necessary to define the notion "mechanism" as a certain complex of economic methods, controlling actions and

levers that turn the activity of economic entities to a certain direction or make them achieve set goals by means of interaction of a number of subsystems (functional, information, legal and supply subsystems).

The logistical support mechanism for the airline's innovation activity is a totality of economic relations, principles, methods and tools of logistic control that are used by the company for managing innovation processes. Tools of such mechanism are focused on effective use of innovation potential of an airline by means of search, implementation and promotion of innovations that will meet present and latent demands of customers (clients), will give unique competitive advantages and correspond to the goals of a company on the market of air transport services.

Development of the logistical support mechanism for the airline's innovation activity should be based on fundamental principles of logistic concept (Figure 2).

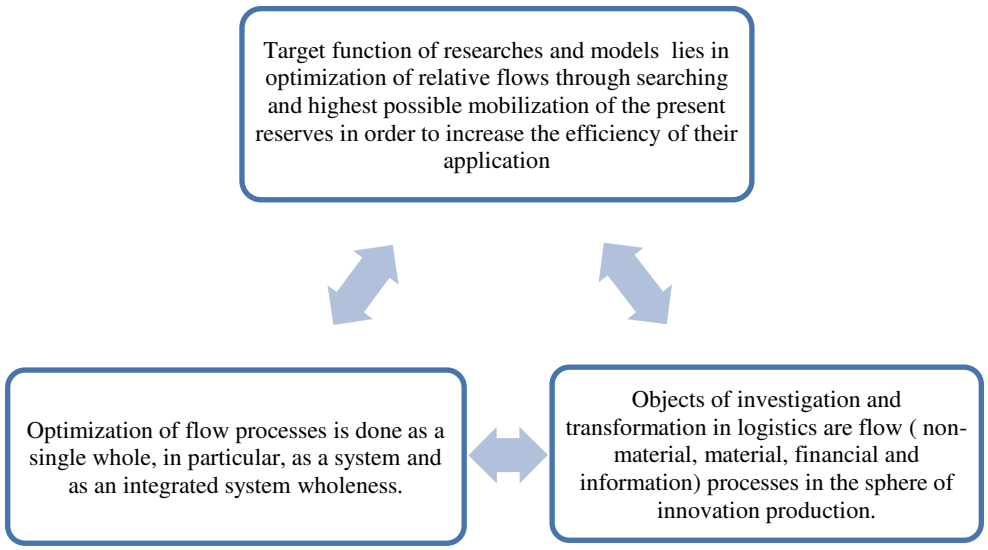

Figure 2 Fundamental principles of logistic concept in the innovation activity of companies (Developed by authors)

In the process of development of the innovation activity mechanism, the following functional strategies – innovation, financial, logistical and marketing – are subjected to the general strategy. These strategies closely interact and supplement each other.

Peculiar features of the mechanism of the airline's innovation activity are defined according to the nature of innovation solutions and involve:

- studying and monitoring the most acceptable and optimal innovative solutions and technologies, which is based on complex marketing researches, benchmarking and on the system of logistical support;
- bringing into compliance the innovation strategy and its components with the strategic mission, objectives and tasks of the general strategy of the airline's development on the air transport market;
- ensuring interaction of interests of air carriers and interests of other participants of innovation process. During the implementation of innovation project, information, financial as well as material flows that run among main participants – airlines,

airports, passengers, investors, owners of innovations and the state and their interests is an integral part of the substantiated mechanism;

- adaptation of levers and means of innovation process management to macroenvironment conditions (Kosenko, V. and Milash, L., 2016).

Logistical support of innovation solution implementation comprises input and output information and material flows, where the input flows are the sources (internal documentation of an airline, intermediate reports, external sources of information), whereas the output flows materialize in various forms of reporting and control over the process of implementation of the substantiated innovation solution.

The study of scientific literature and practical experience confirms that the logistic system of an airline should be formed to ensure efficient organization of its innovation activity and to ensure the course of innovation processes within the enterprise and between the enterprise and its counteragents. Logistical support of the airline's innovation activity involves a complex of managerial decisions on organization of material and technical support of innovation activity, on spatial and time synchronization of innovation production processes and their commercialization, on harmonization of economic interests of all participants of air transport supply chains in terms of satisfaction of consumer needs.

Development of the logistical support mechanism for the airline's innovation activity on the market of air transport services can be described with the help of the Figure 3.

Therefore, material, information, financial flows of the airline's innovation activity that run among the main subjects – airlines, airports, passengers, investors, owners of innovations and the state as well as their interests is an integral element of the logistical support mechanism of the airline's innovation activity.

The main task of logistical support of innovation solutions system should become:

- optimization of economic flows of the airline's innovation process in order to maximize system-wide effect of the airline's activity on the market of air transport services;
- rationalization of operations connected with efficient functioning of an airline in the circumstances of a dynamic external environment;
- building and expanding innovation potential of an airline – possibilities of an airline in the sphere of its main activity aimed at ensuring high efficiency of main business processes and economic potential of a company. In this context logistics should ensure the transfer of material, information, financial flows and control the high quality of these business processes.

Logistical support of the airline's innovation activity on the market should comply with the following principles: the principle of unity, the principle of integrity, the principle of cohesion and functional interaction, the principle of synergic effect achievement, etc.

In the process of logistical support of innovation solutions implementation in the activity of airlines an integral logistic paradigm should be used. The latter accomplishes common strategic, tactic or operational business purpose of an airline and participants (elements of logistic system) by optimal use of material, financial, information and workforce resources and by coordination of local criteria for operation of logistical system elements with the global purpose of optimization.

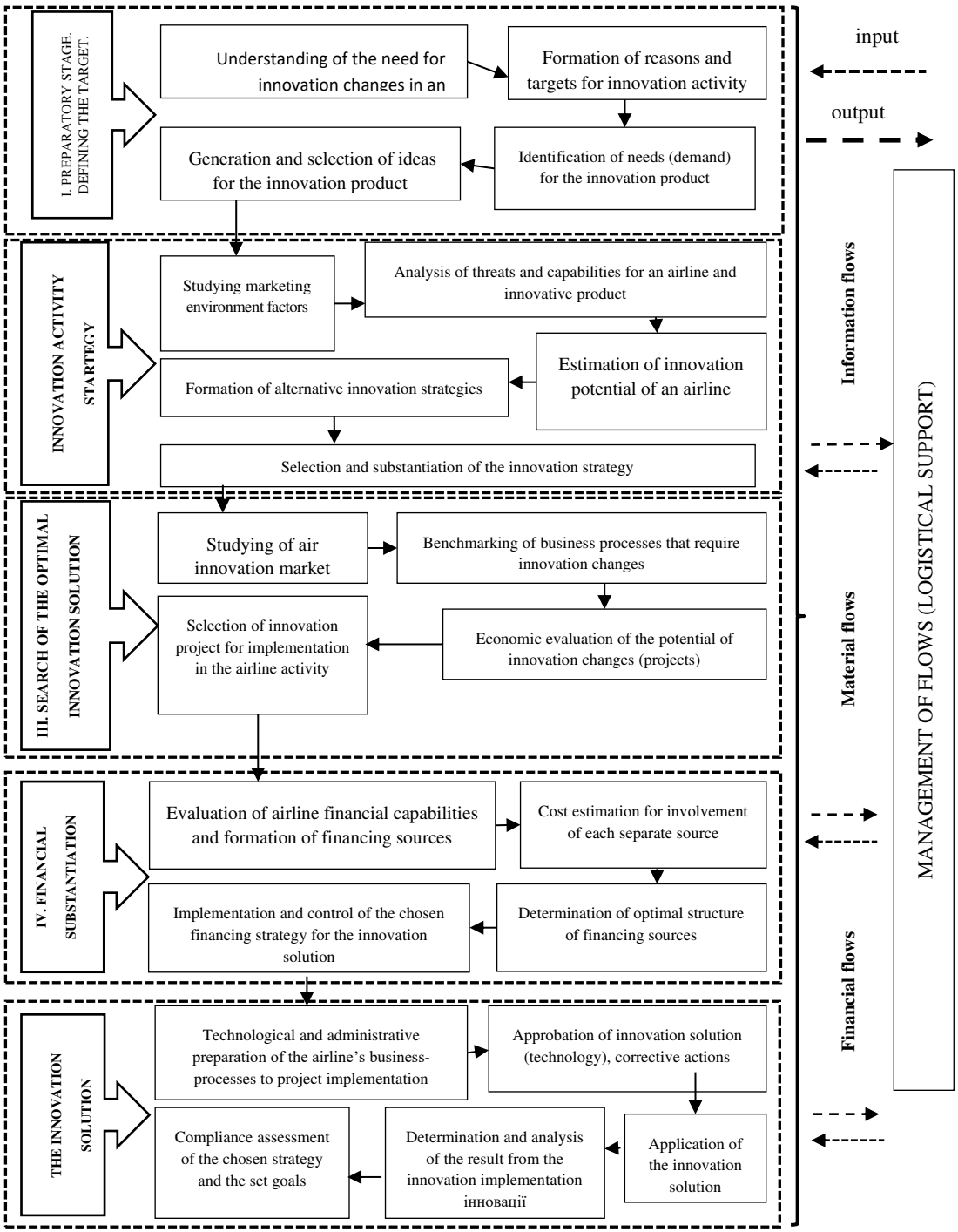

Figure 3 The algorithm of formation of the logistical support mechanism for the airline's innovation activity (Developed by authors)

Through generalization of international experience on logistical support of innovation activity of airlines, on Figure 4 it has been visualized the objectives tree to improve the efficiency of logistical support of the airline's innovation activity on the market of air transport services.

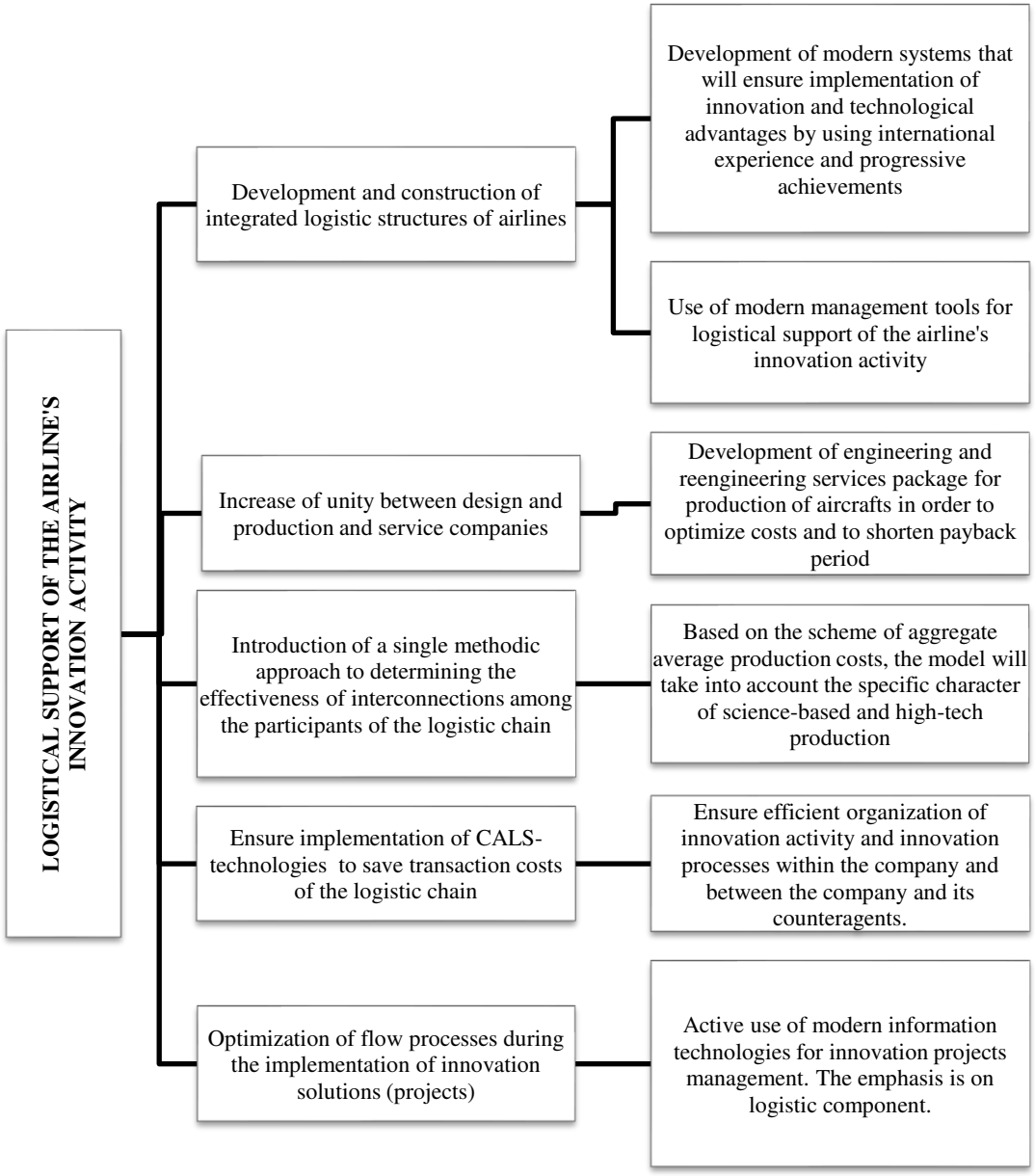

Figure 4 The objectives tree to improve the efficiency of logistical support of the airline's innovation activity (Developed by authors)

Thereby, successful introduction of modern innovation technologies into the airline's operation require a complex approach and significant planning work to integrate such technologies into business processes of a company. To achieve this goal, it is currently important to use managerial logistic experience as the latest scientific and practical concept aimed at increasing efficiency of air transport enterprises through optimization of logistic costs, and thus, at increasing their profitability and improving financial, economic and social indicators.

5. CONCLUSION

Conducted research has allowed to solve the actual scientific problem of future development of theoretic and methodical bases and practical recommendations for supporting innovation

activity of air entities in their logistical activity. Methodical and analytic substantiation of logistic influence on innovation activity of an enterprise becomes the basis for elaboration and making managerial decisions on further development of airlines on the market of air transport services.

This study has allowed to build the algorithm of the logistical support mechanism for the airline's innovation activity that takes into account material, information and financial flows. The substantiated model helps to specify business processes of a company in the context of the logistical support mechanism of the airline's innovation activity.

It is considered that the conceptual approach to logistical support of the airline's innovation activity implies that the logistic system is formed on the principles of streaming of innovation processes inside airlines and between them, their clients and counteragents. The logistical support mechanism for the airline's innovation activity involves operation of main flows (information, finance and material), organization of connections and relations between subsystems and components of the system, mutually agreed composition of these subsystems and elements where each component has own specific function. The mentioned mechanism functions as an instrument for generation and implementation of innovations based on resource potential of airlines.

The following scientific and practical results have been obtained: the model of the economic mechanism of logistical support for the airline's innovation activity on the market of air transport services have been formed; the directions for integration of the logistical support components into the business system of airlines have been suggested; the practical recommendations in the form of the objectives tree for improving the efficiency of logistical support of the airline's innovation activity have been presented.

The principal direction of further research is seen in ensuring the efficiency of the innovation development of airlines according to the requirements of postindustrial economy of the new generation "Industry 4.0" and the demands of the global information space.

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