FACTORS OF LOGISTIC SYSTEM OPTIMIZATION: METHODOLOGICAL DIMENSION

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─Abstract ─

Logistics is defined classically as an integrated science, which aims to solve the problem of optimal control of the movement process of various flows: physical (resources or goods), financial, informational as well as the movement of human resources. To solve the logistic problems the systematic approach to logistics is needed, i.e. investigations of logistic operations and functions in the sector of logistics. Drawing attention to the realities of economic life it is necessary to analyze the relation between uncertainty and certainty in the logistics, as well to create the algorithm for the logistics system optimization. However, the paradigm of research and logistics systems in the global economy should pay attention to the realities of the economy. This is how the authors of this paper make their research. They do research in the light of the relation between uncertainty and certainty of the logistics, creating algorithm of the logistics system optimization. To explain the mechanism of the relation of uncertainty and certainty in logistics the model of management decisions on the dismissal of staff can be successfully used. Logistics system optimization algorithm is able to provide coherent decision

– making on strategic competitive alternatives directions of traffic flow, increase efficiency in terms of the functioning of logistics systems.

Key Words: *uncertainty, logistics, logistics management, logistics systems, competitiveness, optimization, methodology.*
JEL Classification: D81, L90, R40

1. INTRODUCTION

The processes of globalization in the economy make it necessary to identify and leverage the competitive advantages of logistics systems, both at the national and international level. Taking into account the purpose of logistics and solving the problems of optimal control of the flow (material, informational and financial), it becomes necessary to control not only the physical movement of flows or the choice of suitable technological parameters but it is also very important to ensure a harmonious process of competitive and strategic decision making concerning alternative direction of flows, increasing its effectiveness in terms of the logistics systems.
Drawing attention to the realities of economic life it is necessary to analyze the relation between uncertainty and certainty in the logistics, as well to create the algorithm for the logistics system optimization.
Object of the study – logistics systems.
Aim of the article – to explore methodologically the possibilities to optimize the logistics systems in the global economy.
Purpose of the study:
1. to identify the levels of uncertainty and certainty in the logistics;
2. to create an algorithm of logistics systems optimization.

Research methodology. The following scientific methods were applied in this study - systematic analysis of scientific literature, logical analysis and synthesis.

2. LEVELS OF CERTAINTY AND UNCERTAINTY IN LOGISTICS

The nature of logistics sector is to serve local and international flows of goods, generated in regions and industries of the country. At the same time they are

distributed and perform other work, including the creation of value added. Thus, the logistics industry can offer the best solutions for transportation, warehousing and logistics services, which means the timely control over prices and increased competitiveness of products, both in the local and international market.

To increase the efficiency of logistics system elements the minimization of the overall costs of the system as a condition for the optimization of its activity is often provided. The process of cost minimization can be performed in separate groups of costs corresponding to running operations, as well as in the whole system. This direct dependence of the elements of the system proves once again the theory of the existence of their interactions and relationships in the global economy.

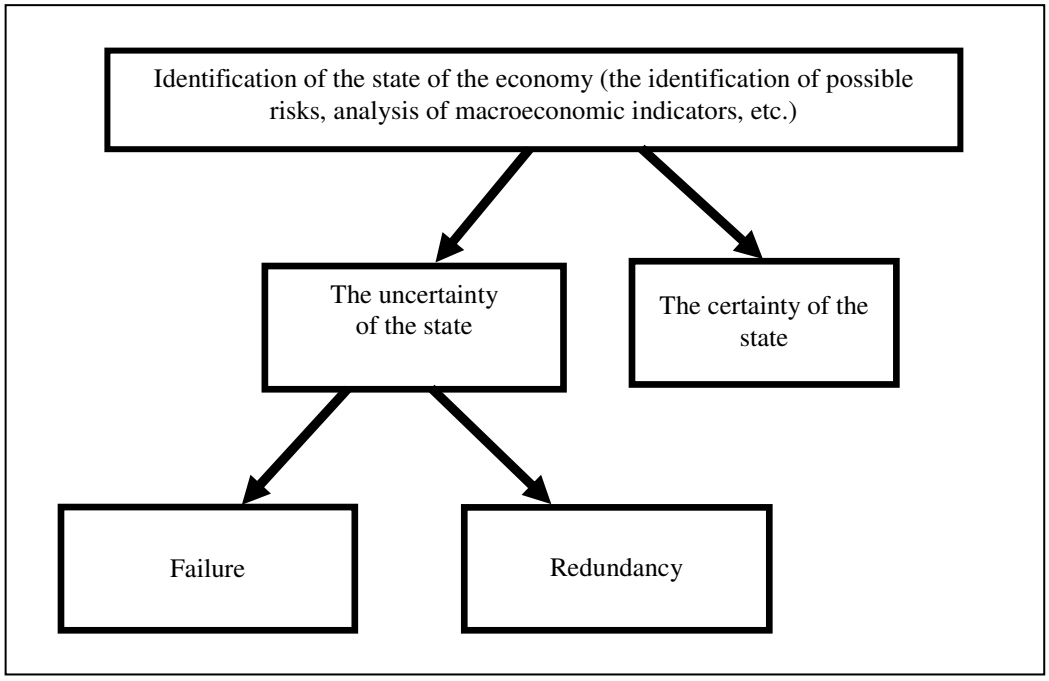
To explain the mechanism of the relation of uncertainty and certainty in logistics the model of management decisions on the dismissal of staff can be successfully used (figure 1.)

Under conditions of uncertainty the decision is nothing else than the selection of a particular course of action in the uncertain state of the economy (which is not known – is uncertain) to achieve the goal. In the implementation of this decision its failure or redundancy is detected. As one and the other reveals the ineffectiveness of the decision. Therefore, it is necessary to create alternative solutions on the analysis of economic indicators. The gap between failure and redundancy should be minimal, since the size of the gap shows a certain inefficiency of decision making and thus maximizes (minimizes) the inverse proportionality of income and expenses of the company. This does not mean that the company has to identify these concepts (failure and redundancy) preparing the companies decision. Not at all, some margin should exist, because it gives the possibility of "race" for the right decision.

Under conditions of global economy, 4 levels of uncertainty are possible. On the fist level the model is still valid and strategies can create only one useful prediction of the future. That is, to define a clear strategic direction a sophisticated analysis is needed. The analysis on the second level shows, that there can be one of the two possible scenarios in the future, but it is not possible to define which specifically. In this case, the strategy must be created using both scenarios. Because there are little scenarios at this level, strategy can be established analytically. At the third level continuous uncertainty prevails. Although there are only a few measures of uncertainty, analysis can not restrict the future to a limited

number of scenarios. At the fourth level there is a certain ambiguity: a set of measures of continuous uncertainty.

Figure-1: Model of management decisions concerning dismissal of staff



Source: Navickas, Malakauskaitė: 2009

Levels of uncertainty determine the type of situation. At the first level the traditional models can be used. For the strategy on the second level there are: planning of scenario, quantitative game theory, models of valuation, etc. needed. On the levels three and four there should be qualitative game theory, analysis of demand and supply, deployment models used.
In most business situations under conditions of global economy the uncertainty of the third and fourth level is inherent. Many aspects of entrepreneurship are related with possibilities of choice, which is possibility, not commitment to change the progress of process realization depending on the situation.

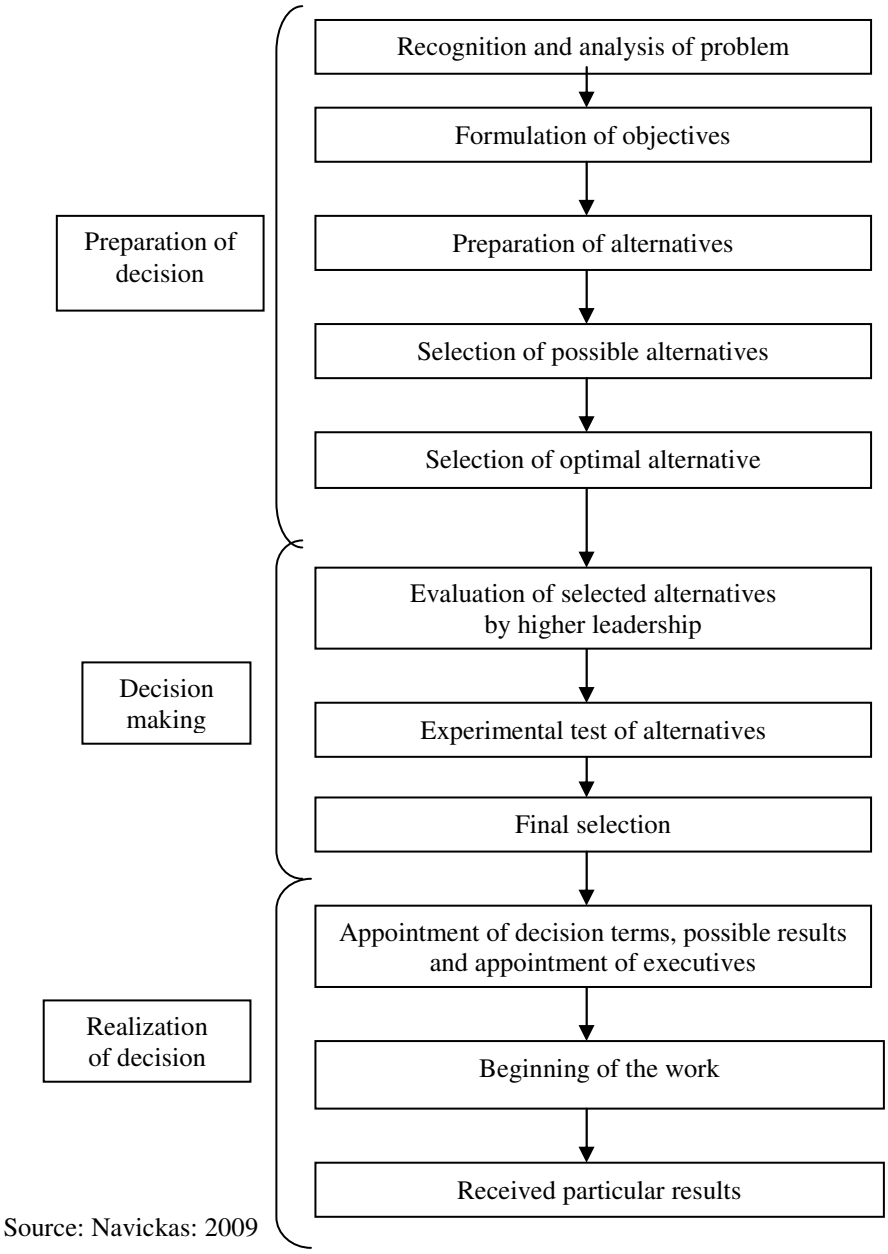
3. ALGORITHM OF LOGISTICS SYSTEMS OPTIMIZATION

Objectives development of logistics system affect directly the performance efficiency of human resources, achieving balanced development of production and the economy as a whole, as well as the distribution of redistribution of resources. So the balance business – environment is maintained. The main characteristics of this balance are the level of development and the value of the industry in terms of human resource development. Very important characteristics as well are relationship between the state of infrastructure and the state of environment, the level of dependence on energy and the specific relationships between various elements of the logistics industry.

The very mechanism or the preparation, implementation and further optimization of logistics solutions are quiet complicated.

In many ways (in terms of methodology) it helps to clarify the model (algorithm) of stages form management solutions (see fig. 2). In this model, which is very easily transformed into and optimization algorithm of logistics systems, the stages of management solutions (preparation of solutions, decision making, implementation of the decision) are clearly delineated. In the analysis of each phase a complex of multifaceted problem reveals. At the first stage (preparation of solution) local authorities have to realize how significant the problem for the region is. It does not matter whether it is building of a new plant, agriculture or simple planting of a new park or playground for children. In any case the new facility will appear in the region, which will serve not only as an auxiliary factor to the already functioning regional economic system, but also will expand it, and thus will attract to the region if not the investor, or just tourists, then, at least, increase the curiosity of the area. As one or the other will increase the competitiveness of the region. Realized the need and importance of the preparation of solutions allows to formulate specific goals. It is necessary to have alternatives, because it is not clear in advance, what the reaction and behavior of citizens of the region to new investors, agro-industrial complexes, a simple increase in the number of children's playgrounds, etc. will be.

Figure-2: Stages of management decision



Source: Navickas: 2009

Moreover, in this model (figure 2) the selection of possible alternatives and more – the selection of the very best alternative is supposed. Emphasis on optimality is usually built on the basis of economic considerations – the criteria (income, profit, cost, etc.). However, the search for the best alternatives for preparing management solutions include the local (regional) authorities, optimality criterion can become social problems, their severity, even the implementation of certain interests of local authorities. You may find out that the new park for residents is more needed than the plant and the new building for the authorities – more needed than the park and etc. From an economic point of view, the best alternative seems to be strange. From the point of view of the social need of the region – almost normal. Moreover, what the local authorities usually do not forget about the possibility of the extending its mandate (elections still will be). The model should be supplemented with objective and subjective factors in the completion of the administrative decision (stage 1). As the authority's decision on regional development is often owned by the local authorities, there are cases when the best alternative is recognized alternative with a strong subjective factor.

The second stage of stages of management decision model is defined as decision point. The essence of this stage is that the final choice of the version which will be implemented will be made. It is necessary to check the experimental and other alternatives. The factors of objectiveness and subjectivity are also present when testing alternatives. For example, the industrial company can offer the technique of counting the value of investments and the local authorities can conduct a survey (questionnaire) of the population of the region in such a way, that the planting of the park will be most important.

The third stage of stages of management decision model becomes nothing more than the direct implementation of the decision by signing contracts with contractors, suppliers, etc. and the beginning of the design, construction and other work on the implementation of a ready specific project. However, in the third stage of the model the leading core of managerial decisions is not selected. Therefore, the third step is to enter the leadership core for the implementation of solutions. Its composition would allow to draw conclusions about the correlation of objective and subjective factors on management decisions. The predominance of the subjective factors shows that not the most effective solution was chosen.

4. CONCLUSION

By the authors of the paper conducted research shows that decisions under the uncertain conditions are nothing else than the choice of particular course of action uncertain state of the economy (once known – indefinitely) to achieve the company goals. In the implementation of this decision and its failure or redundancy is detected. The gap between the under – and over should be minimal, since the size of the gap shows inefficiency of the solutions maximizing (minimizing) at the same time the inverse proportionality of income and expenses of the company.

Logistics system optimization algorithm is able to provide coherent decision – making on strategic competitive alternatives directions of traffic flow, increase efficiency in terms of the functioning of logistics systems.

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