

Concept and premises of the logistic management model in conditions of uncertainty - research approach

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Abstract. The article aims to present the results of the preliminary study, defining the premises of the concept of creating a model of logistic management in conditions of uncertainty. The focus group interviews (FGI) determined the premises for building the concept of logistics management in conditions of uncertainty, and then a catalog of methods for building this model was selected. The results allowed to make general conclusions that the model of logistic management in uncertainty is possible to develop, which in turn allows setting the target for the proper research.

1. Introduction

Conditions of uncertainty become an integral part of the environment in which the company functions. Therefore, what is more, important is the approach to effective logistic management in the situation of unpredictable variable factors and, consequently, uncertainty. One of the ways to extend the management methodology to include the impact of uncertainty on the management process and activities is to build an effective logistic management model. The challenge is to find or create management methods that will ensure the stability of processes and at the same time allow them to increase their efficiency while increasing the efficiency of management decisions.

The aim of the article is to present the continuation of the preliminary research of logistic management in the conditions of uncertainty (described in the "Introduction to the research of uncertainty in logistics management"). A synthetic approach to the results of the research leads to discourse regarding the premises of modelling logistics management in conditions of uncertainty, as well as sets directions for the proper research.

The classical review of literature was abandoned due to the conceptual and research character of the article, transferring the theoretical point of view into the discussion contained in the article.

2. Methodology and scope of the preliminary research

In January 2019 the methodology for qualitative research using the focus method was developed (FGI - Focus Group Interview), leading to the designation of the main research objective in the field of logistic management modelling in conditions of uncertainty. The article discusses the continuation of the preliminary study (supported in the article "Introduction to the research of uncertainty in logistics management"). This part of the initial FGI study included questions related to establishing the prerequisites for the need to create a logistic management model in conditions of uncertainty, resulting

in an attempt to deletion of the concept of this model. In two focus sessions, 19 managers from Polish enterprises took part. The research sample was selected on the basis of the so-called purposeful selection, which basic qualifying criterion was to have in the employment and organizational structure the person (s) directly responsible for logistics management (eg logistics managers).

Participants in the preliminary research conducted a discussion on the following issues:

- What are the reasons for considering the conditions of uncertainty in the logistics management strategy?
- Is it possible to develop a logistic management model in conditions of uncertainty?

Treating the above issues as a starting point for specifying the proper research, it should be noted that the participants of the research were free to speak. Next, the answers were cataloged and the participants of the study were asked to give weight to the cataloged responses.

The results of this part of the preliminary research presented in the next part of the article have a synthetic character, which allowed conducting discourse and putting forward conclusions.

3. Research results

- 1) Regarding the first research problem regarding the establishment of reasons for considering uncertainty and modeling of logistic management in conditions of uncertainty, a synthetic statement of results together with the weighting is presented in Table 1.

Table 1. Premises for the logistic management model in conditions of uncertainty

No	Established premises	Rank 1-most important, 6-least important
1	There is a need to increase the level of management effectiveness by eliminating or reducing the impact of uncertainty factors	1
2	There is a need to measure the impact of uncertainty on the management process	2
3	There is a need to measure the effects of uncertainty	5
4	There is a need to create management mechanisms	3
5	There is a need to set basic criteria for making management decisions	6
6	There is a need to build tools that enable effective logistic management in conditions of uncertainty	4

Source: study based on FGI

The results indicating the premises determining, in a broad sense, the need to incorporate conditions of uncertainty into strategic management determine another thesis about the legitimate need to build a logistic management model in conditions of uncertainty. The participants of the study, giving the range to each of the premises, made a gradation in terms of setting priorities. It should be noted that giving the lowest importance does not mean that the premise is irrelevant, but it means giving it a rather ancillary character.

As it follows from this part of the preliminary research, the most important premise indicated by the survey participants is the need to increase the level of management effectiveness by eliminating or reducing the impact of uncertainty factors. It can be clearly stated that this is an obligatory condition, contributing directly to improving the efficiency and managerial effectiveness. This means that logistics management at a strategic decision-making level depends on the skills, qualifications and competences of managers and their ability to absorb new conditions for management. At the same time, the aforementioned condition determines, in the second place, an efficient model of logistic management in conditions of uncertainty.

High importance, according to the participants of the research, has a premise stating the need to measure the impact of non-compliance on the management process. The participants of the study

determined that the proper measurement of the occurrence of uncertainty conditions themselves, their impact on management processes is an obligatory element in the effectiveness of strategic decision making. The measurement of both the impact and also the effects of uncertainty conditions determines long-term decision-making and is at the same time sine qua non for building a logistic management model.

It is important and interesting to note that the participants of the research considered the premise on the need to set decision criteria to be the least important, while on the other hand the premise of a slightly higher rank is finding or building tools enabling effective management.

Participants of the study also recognized that the list of premises remains open, because it depends on the type of business activity, the environment of its operation, resources and formal and legal conditions and geopolitical.

- 2) In the area of the second research problem, the participants of the study considered the problem of building a logistic management model in conditions of uncertainty. It should be noted here that the participants in two stages considered such a complex problem. First of all, it was decided about the flow and the possibilities of developing the model, and then proposed the types of possible models. The results of this part of the research are presented in Tables 2 and 3.

Table 2. A summary of the answers regarding the possibilities of developing a logistic management model in conditions of uncertainty and their rank

No	Established answers	Rank 1- most important, 4- least important
1	There is a possibility to develop a logistic management model in conditions of uncertainty. However, it should be constructed on the basis of knowledge and tools already available. Knowledge and skills are to allow for a response in a situation where there is no possibility of estimating the impact and the effects of uncertainty.	2
2	There is a possibility to develop a logistic management model in conditions of uncertainty. It is necessary to develop measuring tools and create your own - tailor-made catalog of decisions understood as prognostic decisions and responding to effects.	1
3	There is a possibility to develop a logistic management model in conditions of uncertainty. However, it is a model of decision making and management process after the occurrence of uncertainty variables.	3
4	It is difficult to say whether a logistic management model can be developed in conditions of uncertainty, due to the fact that the vast majority of variable factors are not measurable, it is difficult to estimate the effects. However, you can accept a response model.	4

Source: study based on FGI

As the study showed, there is a need to build logistic management models that take into account the conditions of uncertainty at every decision-making stage. The participants of the study recognized as the most important the possibility of developing methods and tools for measuring the impact of uncertainty on the management process and tools for measuring the effects that uncertainty causes. Therefore, it can be said that they should be solutions based on the needs and resources available to managers. Participants also expressed doubts in this regard, stating that due to the fact that uncertainty creates unpredictable variables that can not be estimated unambiguously, there is a risk that individual solutions can not be developed and that only partially can the existing solutions be used.

Based on the above results, the participants of the study attempted to determine the catalog of possible logistic management models in conditions of uncertainty. However, it should be added that this

part of the study concerned only the attempt to indicate the nature of the management model, but it did not concern the development of the models themselves (modeling in econometric meaning), their assumptions and the method of concept development, implementation and measurement. This part of the study is presented in Table 3.

Table 3. List of proposals for logistic management models in conditions of uncertainty and their rank.

No.	Established answers	Rank 1- most important, 3 - least important
1	Scenario 1. Model-based on ex-post response. Taking management decisions are determined by the occurrence or non-occurrence of unpredictable and predictable phenomena and concerns the response to the effects of uncertainty.	2
2	Scenario 2. Model-based on predictive response. The anticipation of the future and the prediction of events, as well as the estimation of the effects of uncertainty, determine undertaking management decisions. A catalog of uncertainty effects determined by the degree of impact of variable factors is required.	1
3	Scenario 3. The model relies on the possibility of blocking the effects of the conditions of uncertainty. The level of hermetic management process determines taking management decisions. Preventive decisions are required.	3

Source: a study based on FGI

From enterprises, the management model based on forecasting methods and tools as well as future anticipation analysis is the most desirable - scenario 2. It should be pointed out that the other indicated scenarios are the answer to the premises declared by the participants (described in table 2). At the same time, it should be noted that each scenario is possible, although it will probably differ in the degree of effectiveness of decisions made about the level of effectiveness of the management process.

4. Discussion

In the current turbulent environment, the decisive factor in achieving the goal in the time provided is the effectiveness of making decisions. As the preliminary study showed, despite the uncertainty conditions being created by unpredictable factors, which are a larger part of the set of variable factors, the conditions of uncertainty should be included in the logistic management strategy. In addition, the assumption was made that it is possible to develop a model of logistic management in conditions of uncertainty based on the scenario. The results of the study confirm the goal set in this part of the study. Positive verification of the working hypothesis allows attempting to set the main goal of the research relevant to logistics management in conditions of uncertainty.

Making the right, effective management decisions requires the ability to assess the reliability of the source of variable factors, as well as knowledge about the possibilities of predicting future events and estimating the consequences. Measurement - because it is referred to in the context of building a logistic management model in conditions of uncertainty - according to the participants of the study is necessary but at the same time can be burdened with the problem of imprecision. There are many ways and approaches, but in each case it is necessary to parameterize variable factors [1]. There is a valid question about the precision of the measurement. It is impossible to completely avoid errors and mistakes in measurement [2]. It is worth noting that for the correct measurement it is necessary to reference the type of decision to sources of uncertainty [3], which determine the typological layout of uncertainty

conditions [3] [4]. Although building a logistic management model in conditions of uncertainty requires precision in the scope of measurement, it should be pointed out that the essence of logistic management from the point of view of effectiveness of management decisions is striving for stability of logistic processes and increasing their efficiency [5]. According to the principle that in every seemingly chaotic system of actions, there is some causal relationship [6] [7], it is a contribution to the statement that the conditions of uncertainty are subject to forecasting in terms of data analysis, statistics and econometrics.

5. Conclusions

Analysing the results of the preliminary research of logistics management in conditions of uncertainty, the following general conclusions were made:

- despite the fact that the so-called unpredictable factors creating uncertainty conditions there is a possibility of modelling logistic management using existing or tailored methods and tools,
- the scenario method is the most adequate decision-making method in logistic management, provided that it is possible to assess sources of variable factors
- the portfolio of the effects of uncertainty conditions can be effectively managed, provided that they have knowledge and skills in the creation and use of management tools
- the logistic management model in conditions of uncertainty is an integrated part of the business management strategy.

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