

THE ESSENCE OF THE DELPHI METHOD AND ITS MAIN ADVANTAGES AND DISADVANTAGES

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Abstract

This article is devoted to the study of the essence and main meaning of the Delphi method, developed in the 50s of the 20th century in the United States. In those years, this method was used to identify the impact of scientific and technological progress in matters of a military nature. Now, the Delphi method is universal and can be applied in any branch of activity, which increases its relevance. In addition, we have studied the main advantages and disadvantages of using this method at the level of world experience. We also considered the problems of using the Delphi method at the level of the Russian economy.

Keywords: the Delphi method, managerial decisions, brainstorming, questionnaire method, interview, expert assessment, statistics

I. Introduction

In the modern world, almost all companies during their activity are faced with certain problematic issues that require timely intervention and prompt decision. Accordingly, the main task of any management team is to search for solutions to this problem in order to plan their further management functions. In our opinion, the stage of decision-making, which is a rather labor-intensive and responsible process, certainly plays an important role in management.

The importance of competent managerial decisions, in turn, increases due to the fact that the decision-maker is responsible not only for personal interests, but, firstly, for the interests of the entire enterprise.

Undoubtedly, in the current realities, there are a number of ways to facilitate the choice of effective solutions, but many companies pay great attention to the Delphi method as the most effective one.

II. Methods

Thus, the main aim of this article is to reveal the essence of the Delphi method, which consists in the development of certain recommendations for the most effective management decision-making, based on the results of an anonymous questionnaire between a group of experts, as well as the consideration of the advantages and disadvantages of the Delphi method use at the current level of the economy development.

In addition, we'd like to note that the Delphi method pursues the ultimate objective to obtain the most accurate and reliable information due to the correct analysis of the proposals of the expert group on a particular problem.

The object of our study is the Delphi method. And the subject is the assessment of the advantages and disadvantages of the Delphi method based on world experience. Also, we'd like to add that during writing this article, various research methods were used, in particular, comparison, synthesis, analysis, and others [1]. The works of both foreign and domestic scientists, economists, as well as various articles, textbooks, Internet resources dedicated to the research topic, served as the theoretical basis.

Thus, based on the above, we can conclude that the topic of our study is quite relevant at the current level of economic development and is widespread mostly in Western countries.

Initially, the Delphi method was developed to assess the impact of various developments on the military sphere, but over time, this method began to be used for any research, thereby becoming universal.

III. Results

So, let's try to reveal the essence of this method, and we would like to start with studying some historical information. Note that this method has an ancient Greek origin and was named after the city of Delphi, inhabited by oracle-soothsayers at the temple of God Apollo.

The mathematician N. Dalkey, the philosopher N. Rescher, the American psychologist T. Gordon and the futurologist O. Helmer were the founders of this method in the 50s of the 20th century.[2]

At the same time, we'd like to note that this method has gained great popularity, serving as an assistant in identifying the most important directions of scientific and technological progress, as well as determining the advisability of investing in certain programs.

That is, the use of the Delphi method gives us the opportunity to assess the state of the industry under consideration also in the long term.

As foreign practice shows, for most of the countries this method is associated, first of all, with its applicability in various government programs, and not separately in the activity of enterprises.

As an example, we can also mention Japan, which applied the Delphi method not at the level of specific enterprises, but, on the contrary, at the level of the entire state to predict national-industrial development in the 70s of the 20th century.

So, what is the essence of this method?

The main message of the Delphi method is to obtain the most reliable expert assessment on a particular issue on which this analysis was carried out with the obligatory observance of the principles of anonymity, remote form of participation, as well as the principle of multilevelness.

Let's note that the questionnaire method, interviews and brainstorming serve as auxiliary tools.

In other words, as a basic requirement, it is possible to include the observance of the most important principle, which is that the experts should be independent and unfamiliar with each other.

This, in turn, gives us the opportunity to obtain the most reliable result due to the fact that experts will not be able to influence the opinions of other experts, thanks to the observance of the

principle of anonymity and remote form of participation.

That is, in other words, the main purpose of the Delphi method is to identify the most optimal way to solve the problem through a competent analysis of the results obtained according to the objective opinions of the expert group.

Accordingly, as we see it, two groups of participants are required to carry out this method of analysis.

The first group is needed in the role of experts who have the status of "independent" in order to assess the problem, while the second is necessary so that, based on expert assessments, they can obtain a generalized conclusion by analyzing the ratio of answers, thereby performing an analytical function.

IV. Discussion

At the same time, the entire methodology consists of several stages, the results of which are calculated using various statistical methods. Regarding the main stages of such an analysis, we'd like to single out the main ones: preparatory, main and final. What is the essence of each stage, and what are their main components? Let's try to answer these questions.

As we see it, the analysis begins with a preparatory stage, during which, foremost, the search for a group of experts to conduct this investigation takes place.

As a rule, it is recommended to form such group of 20 people for a more accurate analysis. But, of course, it is possible to recruit fewer experts. It is also very important to have unambiguously formulated questions that require an exact answer.

The second stage is the main stage, which is characterized, first of all, by determining the problematics by analysts, with further splitting of this problematic into several questions by experts. After collecting these questions, analysts develop a questionnaire based on the most frequently asked questions.

Accordingly, after the questionnaire is ready, the analysts send it to the experts, and they, in turn, scrutinize it and, if necessary, ask to improve the questionnaire if there is not enough information for an expert assessment of the problem under consideration.

After all the improvements, the task of the experts is to apply their knowledge for a thorough explanation of each issue according to the questionnaire. In other words, the expert is required to offer the best option on this issue, by considering all the risks and predicting further development stages.

As for analysts, they must also collect all the material and sort similar answers into one. If there are conflicting points, a generalization of such issues between a group of experts is required, which may lead to a change in the opinion of one or another expert.

And finally, the last stage is devoted to summing up.

Thus, these actions are repeated as long as the respondents do not find a common denominator. In case of some inconsistencies, this indicates that the topic has not yet been fully studied and requires more analysis.

Besides, an important place in the Delphi method is given to the determination of the consistency level of expert opinions, which are calculated using the concordance coefficient, which is mathematically denoted by the letter W and has the formula:

$$W = 12 \left[\sum_{i=1}^n \sum_{j=1}^m x_{ij} - \frac{1}{2} m(n+1) \right] / m^2(n^3 - n)$$

where

m is the number of experts;

n is the number of ranking objects;

x_{ij} is the rank assigned to the i -th factor by the j -th expert.

In this case, we should note that the concordance coefficient has a value from 0 to 1.

If the opinions of experts do not correspond to each other, the value of $W=0$; in case of complete agreement, it is equal to 1. In addition, the normal value of this index ranges from 0.5 and more at a confidence level of 0.995.

Thus, having considered the essence and the main stages of the expert assessment realization of the considered method, we would like to go into the question of the positive and negative aspects of using the Delphi method in practice.

First of all, the processing of statistical information for each individual can be considered as the main advantage, which, in turn, significantly reduces the degree of deviation both for each answer and among the interviewed people.

It is a common fact that a person by nature is an individual, dependent on other people's opinion. And it is always easier to manage such people in the sense that they do not defend their views and interests, and are ready to join the opinion of the majority.

Also, sometimes there is such situation that a person lives according to someone else's opinion, while not even realizing it.

Surely each of us noticed that in large companies the opinion of a more qualified employee is more valued, and even if there is an opposite opinion of the majority, there is some kind of moral pressure in the group assessment during the decision-making process.

That is why, in order to reduce the prerequisites for group influence, the Delphi method goes to the rescue.

From the above, follows the fact that each isolated employee alone can assess a particular situation and predict further development more correctly and objectively, compared to a team of people.

Such division of persons into groups greatly reduces the disagreement between employees, since each of them makes a decision separately. Accordingly, the collective pressure that affects the decision is also excluded.

In other words, according to the Delphi method, a kind of anonymous brainstorming is carried out, where independent of each other experts "team up" and analysts, based on the proposed answers, make a group decision according to special regulations.

At first glance, the considered method seems to be "ideal" with a number of advantages, but, as with any category, this method also has disadvantages, which we will discuss further.

Let's start with the fact that already from the moment of this method appearance, the first criticisms and dissatisfaction occurred, which consisted of several factors.

Firstly, one of the disadvantages of this model is the uneven distribution of authorities between analysts and experts, which is observed in the sense that analysts can exert some influence on a group of experts.

Secondly, it is necessary to understand that not in all cases the opinion of the majority is reliable.

Thirdly, for analysts' part, there is often a failure to use the ideas of minorities that differ from standard opinions, which is incorrect, since often the truth can be hidden precisely in the opinion of a minority, which, unfortunately, will not be applied and considered in the analysis of a particular situation.

Fourthly, the disadvantage of using the Delphi method is also the inability to conduct a fast analysis, since this is a rather labor-intensive and slow process that can take quite a long time.

Fifthly, on the part of analysts it can be observed a situation of being in a comfort zone, which is accompanied by inefficient decision-making, simply focusing on the opinion of the majority, without delving into the issue.

Thus, having considered the main disadvantages of the Delphi method, in our opinion, we can propose the following measures that will be aimed at eliminating these negative aspects of the method.

First of all, we propose during analysts' group formation to select persons with different areas of scientific and social character and preparedness.

Also, we recommend giving the same problem to several expert groups for a deeper analysis.

And an important role is played by the professionalism of analysts in terms of taking all possible answers into account by analyzing those options that do not really seem right at first glance and do not correspond to the opinion of the majority. After all, as we said earlier, the most effective solution to a particular problem can be hidden in such creative answers.

After analyzing all of the above, we can conclude that the Delphi method is quite common in the West.

The widespread implementation of this method is mainly used in such industries as business, strategic planning, futurology, as well as technological developments and other areas.

So, as we see it, the essence of the Delphi method is to effectively assess and resolve certain management issues using the remote and anonymous participation of experts.

Accordingly, the main goal of the method under consideration is the collection of the necessary information by conducting step-by-step surveys to obtain the most optimal solution in the considered situation.

Thus, let's note that at the present level of societal development in Western countries, the Delphi method does not lose its relevance and is in great demand.

In the case of the economy of our country, in Russia, this method, unfortunately, is practically not used, since we do not have the necessary tools for proper control of its application compared to other countries.

The problem of this issue is based on the fact that there are no non-centralized analytical structural units on the territory of the Russian Federation.

That is, in other words, this phenomenon is also connected with the fact that since the historical period of the development of the economy of our country, such analyzes have not been carried out to implement the Delphi method, and there were also no specialized analytical groups that would have a non-centralized existence, which would allow to be independent from the opinion of the majority.

At the same time, we should note that after all there were attempts to introduce this method in the USSR in the 70s during the period of forecasting the scientific and technological development of the country and the whole world.

During this period, the emphasis was mainly put on the circulating sector and the state apparatus. But the result as such was not obtained.

Undoubtedly, during the 21st century, the situation for the application of this method has become much simpler, but there are still the same difficulties in terms of the lack of a proper regulatory framework.

Therefore, for our country an important role is played by the ability to use the experience of other countries in which this method is actively used and is in great demand in order to promote the Delphi method in Russia.

So, we can conclude that the Delphi method serves as a useful tool in making certain decisions on the management of enterprises and the state. In particular, the use of this method is more relevant for large companies.

Thus, we have considered the main essence of the Delphi method and identified the main advantages and disadvantages of its application.

As we see it, despite the implementation of any method of risk analysis, it is necessary to always be prepared for the fact that in today's unstable developing relations the situation can change at any moment and have deviations from the foreseen.

But, in general, despite these disadvantages, it would be advisable not to forget about the main advantages of this method with proper use of it.

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