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FORESIGHT AS A TOOL FOR ESTIMATING THE QUALITY OF SCIENTIFIC ACTIVITY

The article analyzes the problems of ensuring the quality of expert activity and possible ways to overcome them. Studies have shown that in this area, periodically there are situations that call into question the quality of expert work. At the same time, quality assurance procedures are either not provided or do not apply in practice. In view of the lack of common methods, a single scientific base, a single format, the conclusions of the expert evaluation results vary, and there is no control from the expert community or the consumer. Paradoxically, the subjectivity of an expert's opinion is considered to be the norm. This creates the conditions for the examination to be perceived by interested parties not as a tool for fulfilling the order, but as an independent tool for protecting interests.

Key words: expert assessment, foresight, expertise, objective opinion, motivation, competence.

Мақалада сараптамалық қызметтің сапасын қамтамасыз ету мәселелері және оларды еңсерудің мүмкін жолдары талданады. Зерттеулер осы салада сараптамалық жұмыстың сапасына күмән келтіретін жағдайлар кезең-кезеңмен туындағанын көрсетті. Сонымен қатар, сапаны қамтамасыз ету рәсімдері көзделмеген немесе іс жүзінде қолданылмайды. Бірыңғай әдістемелердің, бірыңғай ғылыми базаның, сараптамалық бағалау нәтижелері қорытындысының бірыңғай форматының болмауына байланысты, ал сараптамалық қоғамдастықтың өзі немесе тұтынушы тарапынан бақылау жоқ. Сарапшы пікірінің субъективтілігі қалыпты деп саналады. Мұнымен сараптаманы мүдделі тараптар тапсырысты орындау құралы ретінде емес, мүдделерді қорғаудың дербес құралы ретінде қабылдауы үшін жағдайлар жасалады.

Түйін сөздер: сараптамалық бағалау, форсайт, сараптама, объективті пікір, мотивация, құзыреттілік.

В статье анализируются проблемы обеспечения качества экспертной деятельности и возможные пути их преодоления. Исследования показали, что в этой области периодически возникают ситуации, которые ставят под сомнение качество экспертной работы. В то же время, процедуры обеспечения качества либо не предусмотрены, либо не действуют на практике. Ввиду отсутствия единых методик, единой научной базы, единого формата заключения результатов экспертной оценки разнятся, а контроля со стороны самого экспертного сообщества или потребителя нет. Парадоксальным образом субъективность мнения эксперта считается нормой. Этим создаются условия для того, чтобы экспертиза воспринималась заинтересованными сторонами не как инструмент выполнения заказа, а как самостоятельный инструмент защиты интересов.

Ключевые слова: экспертная оценка, форсайт, экспертиза, объективное мнение, мотивация, компетентность.

Introduction. Foresight is an organizational management technology that not only allows you to develop an idea of the future, but also contains the potential for its self-realization. It is this, and not the projected side that determines the popularity and spread of foresight. Research has shown that, first of all, the method of selecting the most qualified participants plays a huge role in foresight. They have a significant role in decision-making.

There is a classical problem of selecting and motivating experts, and foresight methods are aimed at solving this problem due to a wide base of expert assessments [1,2].

Creating a network of highly qualified experts who represent the field of foresight application is one of the results of foresight. This network can act as a subject of management. In addition, foresight technology involves the transfer of participants' reasons for making decisions to other participants, i.e. there is an awareness of the reasons for the experts' decision-making. The transmission and ability to perceive the basis of decision-making is an essential part of reflexive management.

Despite the popularity of expert assessment, it also has drawbacks, and one of their main is that the reliability and credibility of the study primarily depend on the competence of the experts involved in the survey. There is no guarantee that the estimates obtained are actually reliable. The existing methods for determining the reliability of expert assessments are based on the assumption that in the case of consistency of expert opinions, the reliability of assessments is guaranteed. It is not always possible to agree with this statement, since there are cases when individual experts who do not agree with the opinion of the majority gave correct estimates [3, 4].

Therefore, the unanimity of the majority of experts is not always a criteria for the reliability of assessments. Hence the need for careful selection of experts. The fact is that many issues, especially non-standard ones, should be discussed by highly qualified experts. Forecasts made by "average" experts will be based at best on traditional, familiar estimates, while highly qualified specialists will discover and evaluate hidden factors.

Often expert assessments do not have sufficient stability, i.e. the expert can evaluate the same events in several repeated examinations in different ways. The more stable the estimates, the more you can trust them. However, in practice, re-examination is extremely rare due to organizational and financial problems, i.e. there are certain difficulties in conducting a survey of experts and processing the data obtained.

The reliability of estimates can be improved as follows. It is necessary to analyze the data on the discrepancies of expert assessments and their actual values found in the process of implementing events, and make appropriate reassessments of the competence of experts. In particular, putting the remuneration of experts in direct dependence on the level of their competence. Experts with low competence should not be involved in further examinations [5, 6].

When finding estimates by expert way, in addition to the error introduced by the lack of information about events and insufficient competence of experts, a very different kind of error is possible, due to the interest of experts in the results of the assessment, which affects their reliability. The presence of this type of error can significantly distort the estimates, so that appropriate measures should be provided to eliminate the error.

Methods of research. Foresight is based on the method of expert assessments and includes: active formation of the image of the future instead of its possible prediction, focus on determining key development priorities, the relationship with the process of making managerial decisions.

Research results. The composition of experts involved in the assessment is a key parameter that determines the quality of the future forecast. We believe that the following tasks need to be solved in order to conduct a high-quality examination:

- 1) assess the level of competence of experts;

- 2) determine the size of the expert group;
- 3) form a final list of experts participating in the examination.

To determine the competence of an expert, we denote by Q the set of experts, then to assess the level of competence of each i -th expert ($i = 1, \dots, m$) we use the generalized indicator of the level of competence (K_i) given in [7, 8], which takes into account both professional activities and personal qualities of experts:

$$K_i = \frac{1}{4} \sum_{j=1}^4 K_{ij} \quad (1)$$

where K_{i1} is a coefficient reflecting the level of professional training and awareness of the i -th expert (takes into account the levels of qualification “doctor of sciences”, “candidate of sciences”, etc. and is measured in points $0,5 \leq K_{i1} \leq 1$);

K_{i2} – coefficient reflecting the level of basic argumentation of the i -th expert when he makes a decision (takes into account factors such as intuition, production experience, theoretical analysis, etc., and is measured in points of $0,5 \leq K_{i2} \leq 1$);

K_{i3} – coefficient reflecting the personal qualities of the i -th expert, and calculated on the basis of self-assessment ($0,5 \leq K_{i3} \leq 1$):

$$K_{i3} = \frac{1}{n} \sum_{j=1}^n K_{i3j} \quad (2)$$

где K_{i3j} – the coefficient reflecting the self-assessment of the i -th expert on the presence of his j -th personal quality; n – the number of personal qualities of the expert;

K_{i4} – coefficient reflecting the personal qualities of the i -th expert, and calculated by fellow experts ($0,5 \leq K_{i4} \leq 1$):

$$K_{i4} = \frac{1}{n * m} \sum_{l=1}^m \sum_{j=1}^4 K_{i4jl} \quad (3)$$

K_{i4jl} – the coefficient given by the l st expert about the presence of the j -th personal quality of the i -th expert; n – the number of personal qualities of the expert; m – the number of experts participating in the assessment of the i -th expert).

As a criteria for evaluating the required number of experts, we use the following formula:

$$N_{\min} = 0,5 \left(\frac{3}{\varepsilon} + 5 \right), \quad (4)$$

where N_{\min} – minimum required number of experts; ε – parameter that specifies the minimum level of expertise error ($0 < \varepsilon \leq 1$).

If the possible error of expert analysis is 5% ($\varepsilon = 0,05$), the number of experts must be at least 32.

According to [9], the required number of experts for the group assessment should be at least 7-9 people, therefore, the number of experts involved in forecasting is within $7 \leq N \leq 32$.

To get a final list of all experts who have passed the certification, they are ranked by the level of competence (the value of the generalized indicator K_i) and in accordance with the ratio (4), a list of experts participating in the examination is formed.

In this case, the question of the motivation of experts and the assessment of the quality of the examination itself remains open (there is no guarantee that a particular expert will not put up evaluation points on the basis of a superficial review of the work or on the basis of certain subjective considerations).

It is possible to distinguish the following factors of motivation of experts when conducting an independent examination of scientific and technical projects:

- the amount of material remuneration for the examination;
- expanding scientific horizons;
- acquisition of additional expertise to the examination;
- getting additional information about projects implemented under any programs;
- obtaining a certificate of expert status.

The list of motivation factors was formed based on the analysis of existing approaches to the selection of experts and previously conducted research on the motivation of expert activity [10].

Discussion. Let us consider the mechanisms for ensuring the quality of expert work and the impact of the above factors on the quality of expertise. The examination is essentially an applied research in order to answer the questions posed by the customer. Although its differences from “pure” science suggest a special character of quality assessment based on the model of “virtuous mind”, expert knowledge is still usually presented with the criteria of success and validity characteristic of scientific knowledge. Validity implies that, ideally, epistemologically reliable knowledge should leave no room for interpretation, for challenge, and for misuse.

Analytically, several quality assurance mechanisms can be identified. The basic is the selection of suitable experts - the idea of expertise itself is based on the confidence of amateurs to the opinion of people who, in their opinion, have competence in a particular area [11]. However, research procedures can also be organized in such a way as to minimize subjectivity, bias, and errors. First of all, it is important to have clear criteria on the basis of which you can distinguish between bad and good work. Further, generally accepted methods and standards for presenting results form the basis for comparability of research subjects and reduce the subjectivity of conclusions. This ensures, as in academic science, the validity of expert knowledge, its epistemological reliability [12].

Examples of discussions around techniques used by scientists acting as experts show the critical importance of this mechanism. Finally, there are tools for assessing the quality of the expert's work and for criticizing his conclusions from colleagues, the General public and the subject who uses the results of the examination. These mechanisms ensure the transparency and publicity of the production of expert knowledge, which means trust in it, as well as its distance from the consumer. The collective work of experts, in which there is a place for discussion and documenting all stages of work, is considered the most suitable for ensuring the quality of the produced expertise. When an expert works individually, peer and community assessments can serve as a partial substitute for collective discussion.

The procedure for conducting the examination assumes that the expert must ensure the objectivity, comprehensiveness and completeness of the research, as well as the reliability and validity of their conclusions, and independently evaluate the results of research received by him personally and other experts, responsibly and accurately formulate conclusions within their competence.

Summary. Studies have shown that the quality of expert assessments, their reliability and validity largely depend on the level of competence of experts, as well as on the chosen method of collecting and processing expert opinions and motivation of experts. The authors propose a method that will allow to assess the level of competence of the expert, as well as to determine the necessary number of experts to obtain the most objective assessment.

Source of research funding – this article is the result of research conducted in the framework of the project “№AP05132160” Development and implementation of foresight-oriented teaching methods for doctoral and master’s students”, funded by the MES of the Republic of Kazakhstan.

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