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METHODOLOGY FOR FORECASTING STAFFING IN FORESIGHT RESEARCH

New economic activities are becoming centers of scientific and technological research and development, foreign direct investment, talent development and advanced technology. Technology can significantly change the structure of employment in sectors of the economy by creating new jobs that require specialized and unique skills, new competencies, and at the same time often having a negative impact on jobs dominated by routine tasks.

In many countries of the world, in order to predict the need for new personnel competencies, large-scale studies are carried out using the foresight research methodology, which is focused on identifying possible options for the future of science, technology, the economy and society based on expert assessments. At the same time, long-term (25–30 years) strategies for the development of the economy, science, and technology are being developed, aimed at increasing the competitiveness of the economy and the most effective development of the socio-economic sphere [3].

In order to assess the provision of the economy with personnel for innovative development, it is necessary to solve the following tasks:

1. to determine the need of the national economy for personnel for innovative development;
2. to determine the availability of personnel for innovative development and their competencies in organizations of the real sector of the economy;
3. to determine the possibilities of the education system for training personnel for innovative development [2].

An analysis of the world experience in organizing the forecasting of the need for personnel allows us to distinguish two methodological approaches.

The first approach can be conditionally called «top-down». In the process of forecasting using this approach, the global need for the national economy in personnel is initially determined based on the prospects for economic growth, supply and demand in the labor market, changes in the professional structure of employment, and other macroeconomic factors. Then this need can be detailed by regions, by types of activity, by sectors of the economy, by types of enterprises, by categories of workers, etc.

The second approach can be conditionally called «bottom-up» and it is based on the fact that the initial collection of data on the need for personnel and its dynamics begins with individual business entities (enterprises, organizations), and then the already collected data is integrated by region, by type of activity, by sectors of the economy, and on their basis a nationwide forecast is made.

It should be noted that when applying the «bottom-up» approach to forecasting the innovative development of the economy, including the need for personnel for innovative industries, its significant shortcomings appear:

1. The interviewed experts determine the staffing needs for their enterprise, their current field of activity. At the same time, the possible emergence of innovative technologies and goods in the forecast period, which determine the emergence of new industries, markets, activities and entire new industries, is overlooked;

2. In the conditions of the public sector, the possibility is not ruled out that, in response to a request for a prospective need for personnel for the innovative development of a particular enterprise and the industry as a whole, experts can submit information based on plans and strategies for the development of enterprises that have already been formed and approved for execution, and industries. Thus, as a result of forecasting, instead of a perspective vision, a kind of «distorted mirror» can be obtained – a distorted reflection of plans and strategies that were formed and brought to light earlier. At the same time, the real prospects for the innovative development of individual enterprises and entire sectors of the economy as a whole may be lost out of sight [2].

Thus, when determining the needs of the economy in personnel for innovative development, it is advisable to use the «top-down» approach, in which the possibilities of the emergence of innovative goods and technologies in the period under review are first predicted, and then the possibilities of their implementation in a particular country are assessed, including taking into account available human resources.

The required personnel potential can be assessed by the method of an expert survey. To conduct a survey of experts, an appropriate toolkit

is being developed that involves a certain list of questions about the needs for personnel with the necessary competencies and qualifications for innovative development. It should be taken into account that the expert community should be formed from representatives of technological parks, institutes of the Academy of Sciences, industrial organizations and research and production associations; highly qualified specialists of republican government bodies (hereinafter referred to as RGB), institutions of higher education (hereinafter referred to as HEIs); scientific community.

It is advisable to conduct a survey of experts using the Delphi method. The analysis of the data obtained as a result of the survey is the basis for the formation of a list of personnel competencies necessary for the development of forecasting objects in the context of the most important priority areas of scientific, scientific and technical, innovative activities.

Taking into account the results obtained on the need for personnel, the availability of personnel and their competence in organizations of the real sector of the economy is further analyzed. To do this, it is necessary to ensure the solution of the following tasks.

1) Collection and analysis of information about organizations in high-tech sectors of the economy. The list of organizations is systematized in accordance with their activities in priority areas of scientific, scientific and technical, innovative activities.

2) Collection of data on personnel potential in organizations of high-tech sectors of the economy, scientific, scientific and technical, innovative activities of which are carried out in priority areas.

On the issue of the presence/absence of general, special and universal competencies, it is necessary to interview: representatives of the administrative and managerial apparatus of organizations; employees engaged in scientific research; engineering and technical specialists, including those employed in the field of development work; workers employed directly in production.

Figure 1 illustrates scheme of conducting a survey of employers.

The indicators for evaluation will be:

- the demand for this competence in the organization, but the lack of it to a sufficient extent in the surveyed category of employees;
- the demand for this competence in the organization, the presence and development of it to a sufficient extent in this category of employees;
- the presence and development of this competence to a sufficient extent in the surveyed category of workers, but not in demand in the organization under study [1].

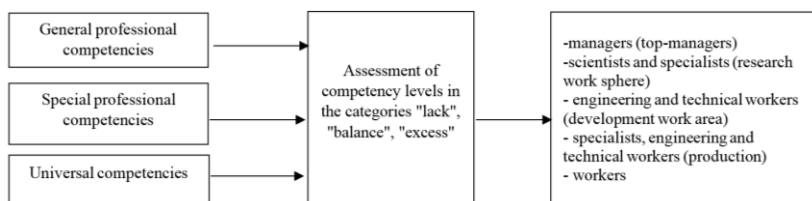


Fig. 1. Scheme of conducting a survey of employers

At the same time, the assessment can be presented on a three-level scale, where the indicators will be an excess, balance or lack of these competencies.

Conducting a survey in organizations that develop high-tech products corresponding to the directions of scientific and technological development, and analyzing the results of the survey will allow us to assess the current and future demand of high-tech enterprises for competent personnel.

Having a general (quantified) need for personnel for an innovative economy, it is possible to assess the need for personnel «for replacement» and for «development of production».

At the next stage, it is necessary to assess whether the domestic education system can provide the required number of personnel with the required competencies, that is, it is necessary to solve the following tasks.

1) Conduct an expert survey on HEI programs.

It is advisable to conduct a survey of managers and heads of specialized departments of HEIs regarding existing educational programs aimed at developing additional professional competencies of personnel for the implementation of innovations.

Needs must also be assessed:

- in personnel training (open new specialties, retrain);
- in sending to study abroad;
- inviting foreign experts.

2) Form a list of competencies in demand for the implementation of predicted innovations based on:

– data obtained as a result of the analysis of world experience in determining competencies related to the introduction and implementation of technological innovations;

– information of the first stage, obtained as a result of a survey of experts (a preliminary list of required personnel competencies for the development of predicted innovations);

– data based on the results of surveys conducted among top managers of organizations.

3) Develop recommendations for improving the training of personnel for an innovative economy for the RGB.

It is advisable to assess the capabilities of the domestic education system in this direction according to the algorithm presented in figure 2 [1].

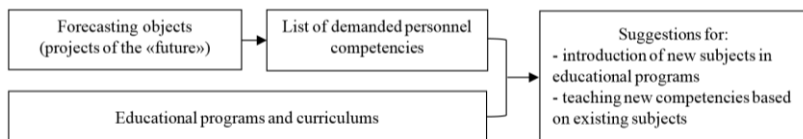


Fig. 2. Algorithm for assessing the capabilities of the education system for training personnel for innovative development

The information received is accumulated in the database on personnel potential in the context of: priority areas of scientific and technological development; organizations implementing high-tech innovations in the selected (chosen) priority area; HEIs that train specialists in the selected (chosen) priority area on the information resource.

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