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EVALUATION OF SOURCES OF INVESTMENT SUPPORT IN THE BASIC DIRECTIONS OF TECHNOLOGICAL MODERNIZATION OF INNOVATION-ORIENTED INDUSTRIAL ENTERPRISES

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N. Dashenko. Evaluation of sources of investment support in the basic directions of technological modernization of innovation-oriented industrial enterprises. The article discloses a methodical approach to determining the investment needs of an innovative-oriented enterprise in the areas of its technological innovation. A system of indicators is proposed that allows to assess the effectiveness of technological renewal and the effectiveness of its investment support.

Keywords: technological innovation, investment needs industrial enterprise, technological competitiveness, methodological approach, indicators, directions, evaluation

Technological renewal of industrial enterprises is essential today, inasmuch as it makes it possible to update products constantly, improving its quality, increasing both its competitiveness and industrial manufacturer's competitiveness. And effective technical and technological development contributes to not only a separate enterprise's, but also industry's and the country's as a whole development. At the same time, in most domestic industrial enterprises, fixed assets have a high degree of wear and tear on the background of a low level of their renewal, as a result of which the quality of products is low, and its cost is high. This explains both the insufficient level of investment and the lack of mechanisms for using the connection between the investment needs of an innovation-oriented enterprise in the areas of technological renewal.

Analysis of recent researches and publications

This problem has been covered in recent years by many scholars, in particular, O. Kuzmin, L. Lipych, O. Melnyk, O. Tovstenyuk [1], I. Kryuchkova, S. Filyppova, O. Balan [2-3], Y. Petrovych, A. Kit, V. Kulishov [4], L. Lihonenko [5], Z. Sokolovska [6]. They considered the stages, mechanisms, tools for managing technological updates and their investment support, including their connection with the innovative development of the enterprise.

Unsolved aspects of the problem

However, the technological upgrade in the segment of innovation-oriented industrial enterprises is not fully explored. This concerns his theoretical basis, organizational and economic mechanism, methodological support and evaluation. In particular, methodological approaches are needed to determine the investment needs of the innovation-oriented enterprise in the areas of technological upgrading and related techniques.

The aim of the article is develop a methodological approach and indicators for determining the investment needs of an innovation-oriented enterprise in the areas of technological innovation.

The main part

To determine the investment needs of an innovation-oriented enterprise, it is advisable to focus on the areas of technological innovation, taking into account two initial statements:

— technological upgrading of an enterprise is impossible without capital and current expenses, that are necessary for it to purchase and install new equipment, to reconstruct production and other premises, to install and commission the production lines and assemblies. Such costs are investment needs and subject to analysis and planning;

— investment costs as a measure of the enterprise's investment support are applicable for determining a) its needs for investment resources and b) the real (planned) level of investment support;

— the methodological basis for definition, estimation and forecasting of investment needs of enterprises, including technological updates, is made up of the most common methods: balance sheet, analogue method and specific capital intensity. However, they are not able to ensure the reliability of forecast indicators, do not take into account the alternative of investment projects and their belonging to different groups of technological upgrades. Therefore, it is proposed to determine the investment needs of the innovation-oriented enterprise by assessing the existing and forecasting the future technological competitiveness of the production and economic system of the enterprise by the author's technique.

Economic appraisal of investment support mechanisms may take place variably, depending on the type of data applied: based on retrospective data on their application; In the absence of such data, when the recipient enterprise uses a mechanism for the first time, it is possible on the basis of prediction of the indicators used in the economic evaluation of investment

support mechanisms with deteriorated accuracy of this forecast. The proposed methodological approach (fig. 1) defines the investment needs of an innovation-oriented enterprise in terms of technological upgrading.

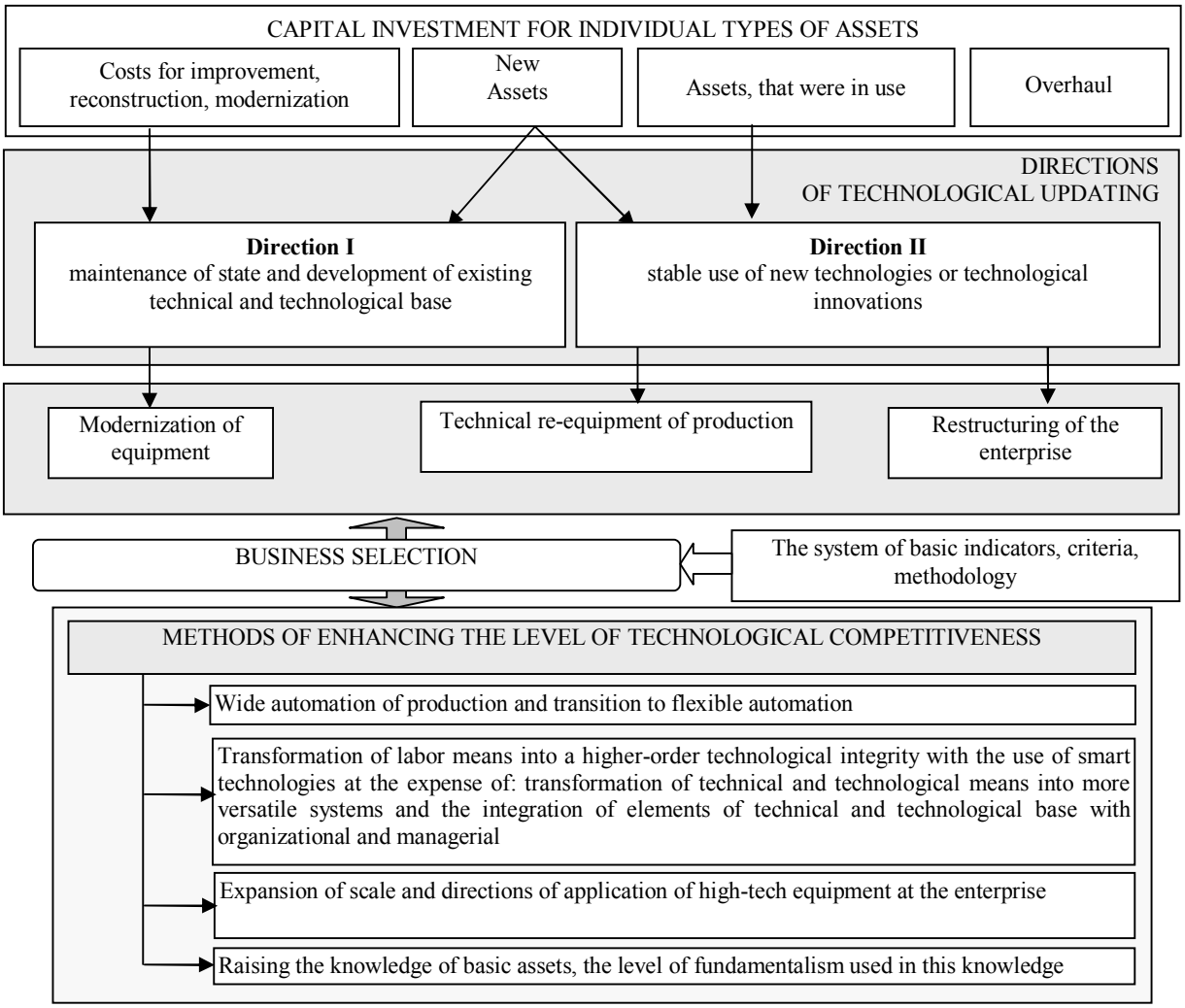

Fig. 1. Determination of investment needs of innovation-oriented enterprise in the areas of technological upgrading: methodical approach
Source: own elaboration

It consists in the following: a) planning of investment costs is based on data on the current state of technological competitiveness of the production and economic system of the enterprise; b) choice of capital expenditures' directions is carried out in terms of assets' types and areas of technological upgrade; c) definition of investment needs is carried out under the influence of methods available to the industrial enterprise to increase the level of technological competitiveness. The final choice is made by the enterprise in terms of "types of assets – the direction of the technological upgrade – the type of technological upgrade – the method of raising the level of technological competitiveness – the sequence of investment projects implementation" provided that the forecast level of technological competitiveness is met with the objectives of the enterprise and investment resources. Estimation of technological competitiveness of industrial-economic system of enterprise is proposed to be carried out in five stages according to the developed algorithm (fig. 2).

Comprehensive testing of methodological approach for determining the investment needs of the innovation-oriented enterprise in terms of technological innovation is carried out in stages with the use of a system of 52 basic indicators of technological competitiveness assessment (tab. 1). Some of suggested indicators have a double affiliation, a mark (+ -). This is due, firstly, to the possibility of using both new equipment and that which was in use (leasing, etc.), and secondly, the alternative of proposed projects.

In other equal terms, it is recommended that the enterprise give preference to engineering infrastructure development projects as providing the basis for the long-term development of technological competitiveness, both group I and II. The composition of basic indicators can be expanded when used in specialized industries, in particular, the indicator "level of concentration" is applicable to transport and logistics complexes.

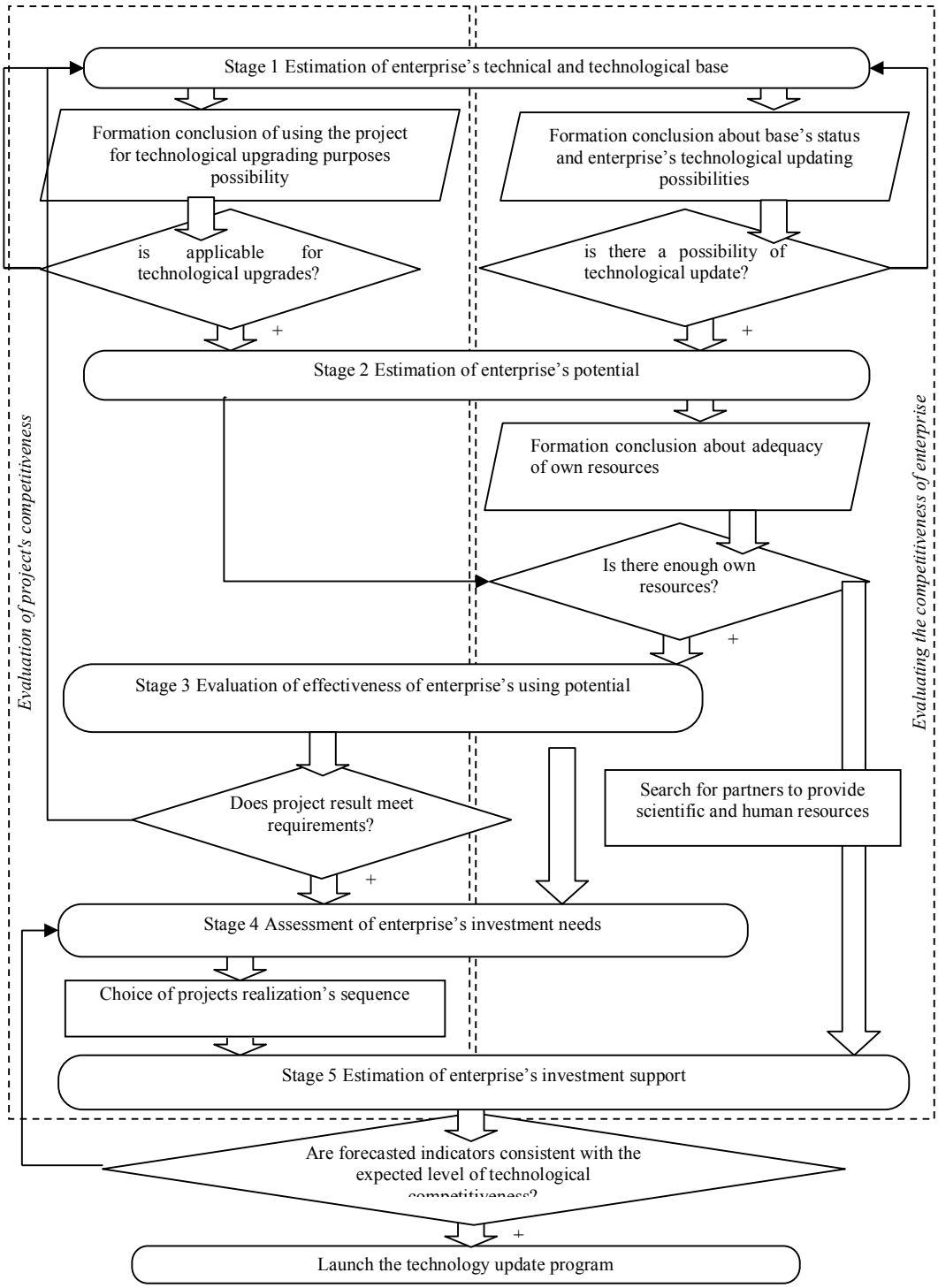

Fig. 2. The process of enterprise's technological competitiveness assessing
Source: own elaboration

Table 1. Summary of the system of basic indicators for assessing technological competitiveness

Evaluation stage	The direction of evaluation	Number of metrics	Affiliation to assessment of competitiveness		
			product	project	enterprise
1. Estimation of enterprise's technical and technological base	The state of fixed assets	5	-	+-	+
	Technical potential	5	-	+	+
2. Estimation of enterprise's potential	Scientific potential	2	+	+	+
	Personnel potential	2	-	+-	+
	Financial and economic potential	2	-	+	+
	Information and communication potential	3	-	+	+
3. Evaluating the effectiveness of enterprise's using potential	Cost-effectiveness of use	3	+	+	+
	Financial result	4	+	+	+
4. Assessment of enterprise's investment needs	Investment attractiveness	6	-	+	+-
	Alternatives of projects	8	-	+	+
	Efficiency of raising funds	3	-	+	+
5. Estimation of enterprise's investment support	The structure of raising funds	3	-	+	+
	The attraction of funds	6	-	+	+
	Risk of external attraction of funds	2	-	+	+

Source: own elaboration

Algorithmic logic is proposed to be used for the abandonment of integral indicators, since they make it impossible to obtain reliable integral results in the calculation of technological competitiveness. The basis of methodological approach is the principle of synchronization, according to which indicators are determined simultaneously for enterprise as a whole and for investment projects for technological upgrading, which are considered by the enterprise. This allows not only to answer the question of applicability and appropriateness of the investment project, but also to synchronize the comparison of projects and the company, identifying those circumstances that lead to the synergistic effect of increasing their technological competitiveness.

Stage 1. Stage is aimed at assessing technical and technological base of the enterprise and defines 8 indicators in two groups – the "state of fixed assets" and "technical potential". The result of the stage is answers to the questions: a) Is there a possibility of technological upgrade at the enterprise?; b) Is the investment project applicable to the technological update of the enterprise?

Stage 2. Estimation of enterprise's potential is proposed to be carried out in nine directions in four areas - "scientific potential", "human potential", "financial and economic potential", "information and communication potential". The result of the phase is conclusion about the adequacy of its own resources in the areas of evaluation for technological update plan implementation. In case of lack of own potential, the company is recommended to search partners.

Stage 3. The assessment of effectiveness capacity's use is performed on seven indicators in two areas of evaluation – "profitability of use" and "financial result". The result of the phase is the answer to the question: for enterprise – "Does it use its potential and be able to implement the project?"; For the investment project – "Does the project's expected results meet the requirements of the enterprise?"

This stage is aimed at researching investment projects selected at previous stages and calculating the investment needs of enterprise for their implementation. Indicators of the "cost of a new product", "investment return" and "technology flexibility" partially take into account enterprise's characteristics, since new projects will theoretically be able to use parent enterprise's potential. The result of the phase is the list and sequence of implementation of projects that most satisfy the needs of enterprise in technological upgrades.

Stage 5. Estimation of investment support of enterprise is proposed to be carried out on a list of sixteen indicators in four areas of evaluation: external attraction of funds, external attraction of funds, external risk attraction risk, nature of investment support. The result of the phase is the decision on resources' adequacy, their nature and speed of receipt, the compliance of the forecast indicators of technological competitiveness to the expected level.

Approval of 52 indicators' system and a methodology for calculating technological competitiveness of an enterprise in two industrial enterprises with one and two alternative investment projects (LLC "HC Micron", PJSC "VO "STALKANAT-SILUR") proved its applicability to evaluation of technological competitiveness investment needs and projects.

It is determined that the first two factors affect technology and technological competitiveness are economic and technological and technological factors (fig. 3). They should form the basis of indicators-indicators system. The evaluation is proposed to be carried out in three groups of indicators: resource costs – by their types in absolute value; growth: revenue from sales of innovative products; net profit; share of the company in the market; assets of the enterprise; intangible assets; generalizations: profitability; payback period of investments; internal rate of return; net discounted income; profitability of the stock. Specification of indicators' set is based on industrial enterprise's characteristics.

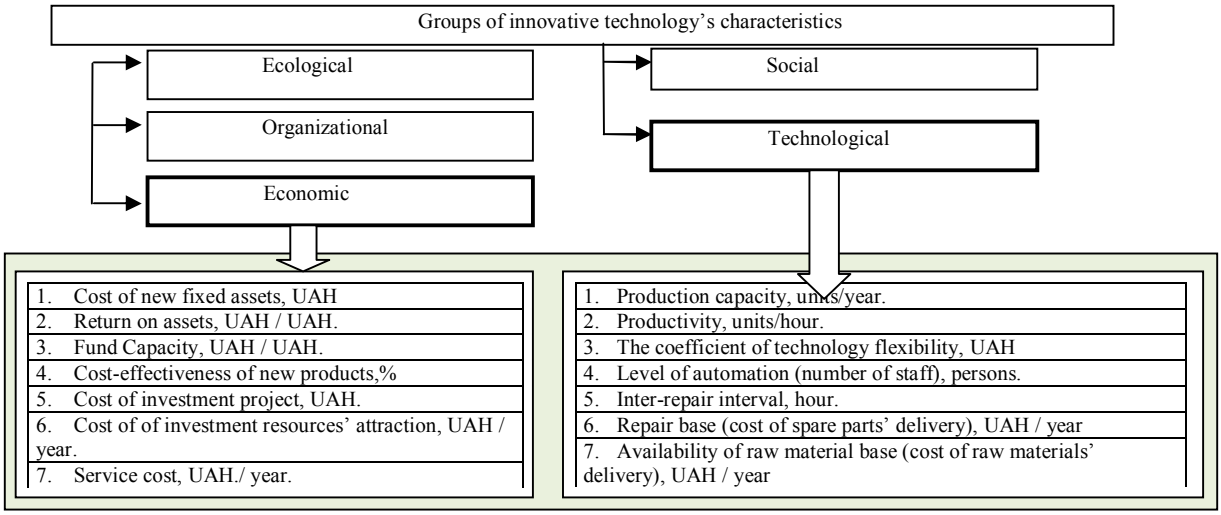

Fig. 3. Characteristics of innovative technologies (fragment)
Source: own elaboration

Conclusions

Developed methodological approaches to determining the investment needs of an innovation-oriented enterprise in areas of technological upgrading and methodical tools for assessing the effectiveness of investment support for technological upgrades are systematic based on them, since the proposed system of indicators makes it possible to perform economic evaluation and the effectiveness of technological upgrades and the effectiveness of its investment support.

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