IRSTI 06.81.12 https://doi.org/10.58805/kazutb.v.3.20-160

METHODICAL APPROACHES TO ENHANCING BUSINESS PROCESSES THROUGH INNOVATION IMPLEMENTATION AT THE ENTERPRISE

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This article describes the importance of developing high technology and a competitive economy in Kazakhstan, as well as the significance of improving business processes and mechanisms to achieve this goal. The success of enterprises depends on the right strategy, competent leadership, the availability of resources and markets, and efficient business processes.

The authors discuss the role of innovation in increasing turnover and production growth of enterprises in the modern world. They emphasize the need to quickly adapt production programs to changing customer demands and short product life cycles.

Special attention is given to the complexity of assessing the beneficial effect of innovations, and two evaluation criteria are presented: the minimum cost criterion and the integrated quality indicator of innovations. It also mentions the use of expert or statistical methods when it is impossible to establish a quantitative relationship between quality indicators and costs.

In addition, the article describes the establishment of a relationship between costs and comprehensive indicators of technical level and economic efficiency using correlation and regression modeling. A methodology is proposed, including traditional normative approaches and the "cost-effectiveness" method.

Keywords: foreign economic relations, competitiveness, national economy, innovations, efficiency, quality, technology.

КӘСІПОРЫНДА ИННОВАЦИЯЛАРДЫ ЕНГІЗУ НЕГІЗІНДЕ БИЗНЕС-ПРОЦЕСТЕРДІ ЖЕТІЛДІРУДІҢ ӘДІСТЕМЕЛІК ТӘСІЛДЕРІ

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Андатпа. Бұл мақалада Қазақстанда жоғары технологиялар мен бәсекеге қабілетті экономика саласын дамытудың маңыздылығы және осы мақсатқа жету үшін бизнес-процестер мен тетіктерді жетілдірудің маңыздылығы сипатталған. Кәсіпорындардың табыстылығы дұрыс стратегияға, Құзыретті басшылыққа, ресурстар мен өткізу нарықтарының қолжетімділігіне, сондай-ақ тиімді бизнес-процестерге байланысты.

Авторлар инновацияның айналымды ұлғайтудағы және қазіргі әлемдегі кәсіпорындар өндірісінің өсуіндегі рөлін талқылайды. Олар кәсіпорындардың өндірістік бағдарламаларын тұтынушылардың өзгеретін сұраныстарына және өнімнің қысқа өмірлік циклдеріне тез бейімдеу қажеттілігін көрсетеді.

Инновациялардың пайдалы әсерін бағалаудың күрделілігіне ерекше назар аударылады және бағалаудың екі критерийі ұсынылады: келтірілген шығындардың ең төменгі критерийі және инновациялар сапасының интегралды көрсеткіші. Сапа көрсеткіштері мен шығындар арасында сандық тәуелділікті анықтау мүмкін болмаған кезде сараптамалық немесе статистикалық әдістерді қолдану туралы да айтылады.

Сонымен қатар, мақалада корреляциялық және регрессиялық модельдеуді қолдана отырып, шығындар мен техникалық деңгей мен экономикалық тиімділіктің жалпылама көрсеткіштері арасындағы тәуелділік-

ті анықтау сипатталған. Дәстүрлі нормативтік тәсілдер мен "шығындар - тиімділік" әдісін қамтитын әдіс ұсынылады.

Түйінді сөздер: сыртқы экономикалық байланыстар, бәсекеге қабілеттілік, ұлттық экономика, инновация, тиімділік, сапа, технология.

МЕТОДИЧЕСКИЕ ПОДХОДЫ СОВЕРШЕНСТВОВАНИЯ БИЗНЕС-ПРОЦЕССОВ НА ОСНОВЕ ВНЕДРЕНИЯ ИННОВАЦИЙ НА ПРЕДПРИЯТИИ

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В данной статье описана важность развития в Казахстане сферы высоких технологий и конкурентоспособной экономики и значимость совершенствования бизнес-процессов и механизмов для достижения этой цели. Успешность предприятий зависит от правильной стратегии, компетентного руководства, доступности ресурсов и рынков сбыта, а также от эффективных бизнес-процессов.

Авторы обсуждают роль инноваций в увеличении оборота и росте производства предприятий в современном мире. Они указывает на необходимость быстро адаптировать производственные программы предприятий к изменяющимся запросам клиентов и коротким жизненным циклам продукции.

Особое внимание уделено сложности оценки полезного эффекта инноваций и представлено два критерия оценки: критерий минимума приведенных затрат и интегральный показатель качества инноваций. Также упоминается использование экспертных или статистических методов при невозможности установления количественной зависимости между показателями качества и затратами.

Вдобавок в статье описывается установление зависимости между затратами и обобщающими показателями технического уровня и экономической эффективности, используя корреляционное и регрессионное моделирование. Предлагается методика, включающая традиционные нормативные подходы и метод "затраты - эффективность".

Ключевые слова: внешнеэкономические связи, конкурентоспособность, национальная экономика, инновации, эффективность, качество, технологии.

Introduction. In the current global economic landscape, Kazakhstan stands at a critical juncture where foreign economic relations wield substantial influence over macroeconomic and social advantages, affecting competitiveness, sustainable growth, and national independence.

Kazakhstan envisions a transformative journey towards a high-tech industry and a competitive economy. This transition necessitates the enhancement of enterprise processes, a fundamental catalyst for economic development.

Enterprise success depends on strategy, leadership, resources, market positioning, and efficient processes. Innovation is pivotal, given the dynamic global competition, changing customer demands, evolving quality standards, and shorter product cycles.

Materials and methods. The development of foreign economic relations at the present stage reflects the most tangible macroeconomic and social advantages that contribute to enhancing the competitiveness of the national economy, ensuring sustainable economic growth, the development, and further state regulation of macroeconomic processes, and strengthening Kazakhstan's national independence [1].

The Republic of Kazakhstan has entered a qualitatively new stage of its development, based on the creation of a high-tech industry and the principles of building a competitive economy. To address these tasks, it is necessary to improve the development of enterprise business processes and the mechanisms for their enhancement to promote the country's economic development.

The long-term success of any enterprise depends primarily on the right strategy, competent leadership, the availability of valuable resources, markets for their

products, and well-structured business processes.

Results and discussion. Increasing turnover and the growth of production of various enterprises in the modern world critically depend on innovations. The prerequisites for the development of these companies in the market are new and improved products and services. Changes in customer demands, evolving quality requirements for products and services, short product life cycles, and increasing rates of product renewal led to the need for rapid adjustments in the production programs of enterprises.

The beneficial effect of innovations in the implementation of business processes, both in production and operation, cannot always be evaluated using cost assessments. Therefore, two criteria are applied: the criterion of minimizing costs incurred and an integral (comprehensive) indicator of the quality of innovations [1]. If it is impossible to establish a quantitative functional relationship between specific quality indicators and incurred costs, expert or statistical methods are used to determine the average weighted composite indicator of innovation. It is calculated as either the weighted arithmetic means or the weighted geometric mean.

The next step can be establishing a relationship between the value of incurred costs and the comprehensive indicators of the technical level of a product or process. Correlation and regression modeling are tools for such an approach.

The proposed methodology utilizes both traditional normative approaches and the "cost-effectiveness" method. With changes in the economic situation during the transition to a market economy, enterprises have had to reorient their criteria for technical and technological levels and the economic efficiency of innovations. In the short term, the implementation of innovations worsens economic indicators, increases production costs, and requires additional capital investment in research and development.

In the design, development, and implementation of innovative technology and technology within the framework of traditional approaches to economic entities, the procedure for determining the economic efficiency of these activities consists of four stages [2].

The first stage is to determine the necessary expenses for implementing innovative measures; the second is to identify potential sources of funding; the third is to assess the economic impact of implementing new technology and techniques; and the fourth is to evaluate the comparative effectiveness of the innovation by comparing economic indicators.

Economic efficiency is characterized by the ratio of the economic effect obtained during the year to the costs of implementing the project. When comparing different options for new technology and techniques, overall and specific capital investments, production unit costs, and so on are compared. However, in the case of innovations, lower costs can be accompanied not only by inadequate technical and quality indicators of the innovation but also by higher specific capital investments. Simple comparison of techno-economic indicators does not allow us to identify the best option. In this case, it is necessary to determine a common indicator of comparative effectiveness of the options based on comparing the savings in incurred costs.

It is important to mention the selection of the baseline technology and technique. The choice of a baseline is necessary for comparing and standardizing the options. Thus, when assessing the level of production technology and choosing a technological solution, it is necessary to classify types of technology into the following categories: obsolete, basic, modernized and improved, and fundamentally new [3].

When choosing the baseline option and technology, the entire range of existing solutions is examined. Then, the general population is divided into groups that are homogeneous in terms of quality, followed by selection within each group. Sometimes it is necessary to aggregate small technological solutions to create larger groups to obtain a unified baseline model.

The choice of a baseline for comparing the initial indicators of innovative technology and techniques is crucial in determining economic efficiency, as the comparative economic efficiency of a new technical and technological solution is determined by comparing the values of indicators between the implemented and baseline options. In this regard, the following points should be considered:

- The choice of a baseline depends on the stage of the life cycle of the new technology and techniques.

- The selection of the baseline and the new solution should be carried out at different stages of the life cycle.

- It is necessary to assess the efficiency indicators of the new design (prototype) compared to the baseline during the R&D stage.

- An analysis of the effectiveness of new solutions should be conducted both during the implementation phase and during production and operation.

All the above principles are important in the systemic analysis of innovations, i.e., in evaluating the economic efficiency of innovations with indicators brought into a comparable form.

The comparability is established based on criteria such as the volume of production, the structure of the product range, product quality, incurred costs, manufacturing lead times, social and environmental impact. In addition, it is necessary to standardize the variants of new solutions in terms of the composition of production resources, i.e., identify additional equipment, additional labor, additional production areas, etc., required for the implementation of innovations. Based on this, additional capital investments should be planned for the implementation of new technical or technological solutions.

In addition to adjusting and correcting the values of total capital investments and product costs, it is important to consider that various expenditure items change differently depending on changes in production and sales volumes. This is most pronounced in the dynamics of changes in fixed and variable costs.

Let's consider the indicators calculated when implementing innovations in the form of state-of-the-art technology and techniques. Expenses for the implementation of innovative technology encompass capital investments, working capital, and labor. The economic effect is calculated using the following formula [4]:

$$E_t = R_t - TC_t$$

where: E_t - economic effect of implementing innovative technology and techniques for the calculation period t, in tenge.

R_t - cost assessment of the results obtained for the calculation period t, in tenge.

TC_t - cost assessment of expenses for the development, implementation, and adoption of innovative technology and techniques for the calculation period t, in tenge.

The alignment of expenses incurred at different times over the entire period of innovation implementation is carried out as follows:

$$R_t = \sum_{t=1}^{T} P_t \cdot \alpha_t$$

where:

- P_t is the cost assessment of innovation results for the calculation period t.

- P_t is the cost assessment in year t.

- α_t is the cost discounting factor.

Costs and capital investments for subsequent years for each option should be adjusted for the time factor, i.e., the cost discounting factor - α_t.

$$\alpha_t = (1 + E)^t$$

where:

- α_t (alpha t) is the cost discounting factor.

- E is the accepted norm for discounting costs incurred at different times.

- t is the time that determines the year of costs and results from the year to which they are discounted (from the baseline moment in time).

The discounting norm E is calculated differently depending on the methodology, industry, type of business activity of the enterprise, and ownership form. In traditional approaches, E typically ranges from 0.08 to 0.10, while in project-based approaches, E is calculated as the discount rate, equal to the investor's acceptable rate of return on capital.

It is also possible to calculate the present value of capital investments in innovations. Usually, the present value of production costs and the use of innovative technology is determined as the sum of the production cost and the normative profit. [5]:

$$TC_t = CV_t + E_n K$$

where:

- TC_T is the cost of production per unit for period "t," in tenge.

- CV_T is the cost of production in period "t," in tenge.

- E_n is the normative efficiency coefficient.

- K is the capital investment per unit of production, in tenge.

- $E_n K$ is the normative profit in tenge.

The annual economic effect of implementing innovative technology and techniques is determined by the formula:

$$E_{IT} = (TC_B - TC_N)N_N = [(TC_B + E_N K_B) - (TC_N + E_N K_N)] \cdot NN,$$

where:

- E_{IT} is the annual economic effect.

- TC_B and TC_N are the total costs before and after implementing the innovative technology.

- $E_N K_B$ and $E_N K_N$ are the normative profits before and after implementing the innovative technology.

- NN is the number of production units.

where:

- E_{IT} is the economic effect of innovative technology, in tenge.

- TC_B is the present value of costs for producing one unit of product using the base technology and technique, in tenge.

- TC_N is the present value of costs for producing product using the new technology or technique, in tenge.

- N_N is the annual production volume using the new technology and technique, in units.

- TC_B is the cost of production for the base variant, in tenge.

- TC_N is the cost of production based on the new technology and technique, in tenge.

- K_B is the capital investment per unit of production for the base variant, in tenge.

- K_N is the capital investment per unit of production based on the new technology and technique, in tenge.

- E_N is the normative efficiency coefficient.

The provided formula serves as the foundation for calculating the economic effect of new technology in all sectors of the economy.

When calculating the annual economic impact of implementing innovative technology as part of capital investments, costs at all stages are considered - creation, development, implementation, and utilization of the new technology; namely [6]:

- Expenses for scientific research, design, experimental, and pilot installations (K_R).
- Costs for the acquisition, delivery, installation (dismantling) of equipment, technical preparation, setup, and production adoption (K_E).
- Working capital replenishment costs related to the creation and utilization of new technology (K_T).
- Expenses (profit) from production and sales of products during the production adoption period preceding the calculated year (K_D).

Then, the total capital investments are calculated using the formula:

$$K_{Total} = K_R + K_E + K_T + K_D$$

.

The calculation of the economic effect from the production and use of new long-term labor assets during their service life is carried out using the formula:

$$Э_{нт} = \left[З_{баз} \cdot \frac{N_2}{N_1} \cdot \frac{\alpha_1 + E_H}{\alpha_2 + E_H} + \frac{(И_1 - И_2) - E_H(K_{п2} - K_{п1})}{\alpha_2 - E_H} - З_{нов} \right] N_2,$$

Where:

$Э_{нт}$ - is the economic effect of the production and use of innovative equipment in tenge.

- $З_{баз}$ and $З_{нов}$ are the unit costs for the base and new labor assets, respectively, in tenge.

- N_1 and N_2 are the annual volumes of production based on the base and new labor assets, respectively, in units.

- α_1 and α_2 are the proportions of contributions to the renovation of base and new labor assets.

- $\alpha_2 + E_H$ and $\alpha_2 + E_n$ are coefficients for accounting for the service life of the base and new labor assets, including moral depreciation.

- $И_1$ and $И_2$ are the annual operational costs when using the base and new labor assets in tenge.

- $К_{п1}$ and $К_{п2}$ are additional capital investments by the consumer when using the base and new labor assets in tenge.

If we are talking about the economic effect of implementing new or improved work items (raw materials, materials, fuel), the formula takes the following form:

If we are discussing the economic impact of introducing new or improved work items (raw materials, materials, fuel), then the formula takes the following form:

$$Э_{нт\,п} = \left[З_{баз} \cdot \frac{P_1}{P_2} + \left\{\frac{И_1}{P_1} - \frac{И_2}{P_2}\right\} - E_H \left\{\frac{K_{п2}}{P_2} - \frac{K_{п1}}{P_1} - З_{нов}\right\}\right] N_2$$

where $Э_{нтп}$ is the economic effect of the implementation and use of a new work item in tenge.

- $З_{баз}$ and $З_{нов}$ are the unit costs for the base and new labor assets, respectively, in tenge.

- $И_1$ and $И_2$ are the annual operational costs when using the base and new labor assets in tenge.

P_1 and P_2 are the specific consumption rates of the base and new work items per unit of work done in units.

N_2 is the annual production volume.

In addition to calculating the economic impact of introducing new labor assets and new work items, it is widely practiced calculating the labor results of innovations in the form of increased labor productivity, reduced material intensity, reduced energy consumption, workforce liberation, and so on. For example, the projected reduction in the workforce because of the introduction of new technology is calculated using the formula:

$$P_t = \frac{Ц N_t}{q_1} - \frac{Ц_t N_t}{q_t}$$

where: - P_t is the release of workers in people.

- $Ц_t$ is the price of one unit of the product in the t-th year in tenge.

- q_1 is the production output per worker before the introduction of innovative technology, and q_t is the production output per worker in the t-th year.

- N_1 is the volume of production in the t-th year in natural units.

In addition to important indicators of the economic efficiency of innovation production and operation, the results of sales volume and the commercial activities of the enterprise in the implementation of innovations are highly significant. For example, the calculation of the projected profit increase from the introduction and sale of new products is calculated using the formula:

$$П = (Ц_t - C_t) \cdot N_t - (Ц_1 - C_1) \cdot N_1,$$

where:

- П is the increase in profit from the production and sale of new products in tenge.

- $Ц_t$ is the wholesale price of the product without taxes in the t-th year in tenge.

- $Ц_1$ is the wholesale price of the replaced product in the base year in tenge.

- C_t is the cost of the new product in the t-th year in tenge.

- C_1 is the cost of the replaced product in the base year in units.

- N_t is the annual production volume of the new product in the t-th year in units.

The analysis of existing and newly proposed methods for forming criteria for evaluating innovative projects shows that there is often a mixing of concepts between project evaluation criteria and indicators of a project's alignment with its innovative purpose.

In connection with this, there is a need for systematizing and distinguishing between groups of concepts and indicators related to a project's alignment with its innovative purpose, as well as criteria for the economic evaluation of a specific innovation (Table 1). As seen from the table, innovations are divided into four alignment groups, each of which has its own corresponding indicators [8].

The assessment and selection of innovations can be based on various methodologies and oriented towards different criteria, the choice of which depends on the specificity of innovation activities, the industry type, and several other factors. The specificity of innovation activities implies the use of both economic evaluation and multifactorial methods, as well as considering various criteria, each of which can be decisive in the decision-making process regarding the implementation of an innovation project. Additionally, it is essential to consider the business processes and the strategy of the innovation project.

Table 1 - Groups and indicators of innovation compliance with the innovative business process

Compliance Groups	Indicators
1	2
I. Economic development of the region, its environmental features, scientific and technological directions of the innovation structure.	1. Compatibility of the project with the economic direction of development of the region. 2. Interaction with the national science and technology policy. 3. Impact on the ecology of the region. 4. Compliance with the innovation policy of the industry and its long-term and short-term goals. 5. Evaluation of the phase of the product innovation cycle. 6. The number of jobs.
II.For commercial purposes.	1. Meeting the needs of the market. 2. Assessment of the total market capacity and market share. 3. Evaluation of the production period. 4. The price of the product. 5. Start-up capital, its value. 6. Probable sales volume. 7. Interaction with competitors. 8. Providing channels of promotion to the market. 9. The probability of commercial success.
III.Scientific and technical level.	1. Novelty. 2. The ratio with the world level. 3. Patent purity. 4. Availability of scientific and technical resources. 5. The probability of technical implementation.
IV.Production capabilities.	1. Progressiveness of the production process. 2. The possibility of providing production facilities. 3. The possibility of providing production facilities. 4. The possibility of production development. 5. Availability of production personnel with appropriate specialization and qualifications.
	Note - Compiled by the authors

Assessing innovations is a very challenging task, and it is even more difficult to determine whether the implementation of an innovation will be effective. Laboratories, firms, and corporations individually address this key question. The reward for making the right decision here is achieving commercial success.

The evaluation of a company's investment opportunities is based on an analysis of the company's life cycle and a diagnosis of its financial condition. The time from the inception of the company to its liquidation is referred to as the company's life cycle. In market theory, there are six stages of a company's life cycle: birth, infancy, youth, early maturity, full maturity, and aging [9].

Determining the stage of the life cycle is carried out through the conduct of a dynamic analysis of the company's activities. For these purposes, the following indicators have been analyzed over the past few years: the dynamics of production volume, the dynamics of the total asset value, the dynamics of equity capital (share capital), and the dynamics of profit amounts.

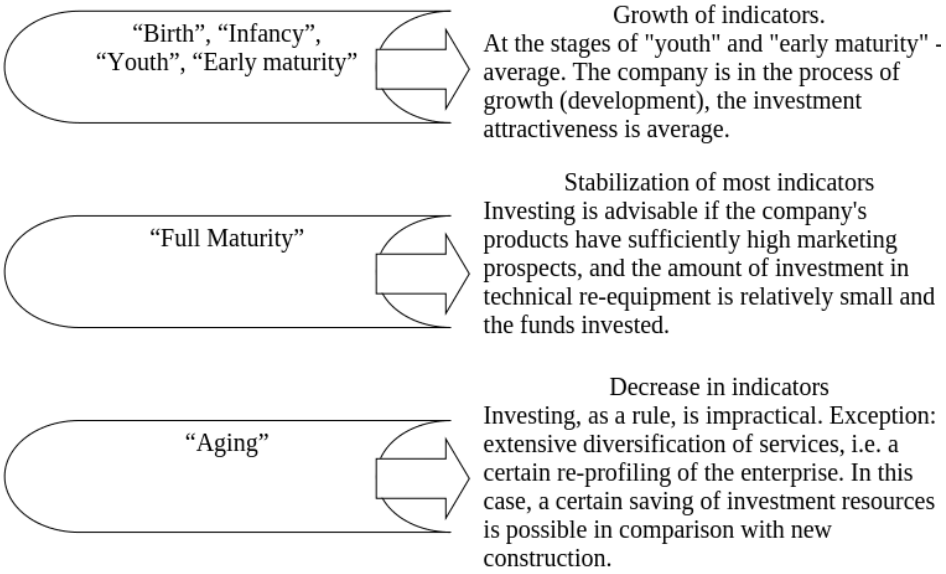

Fig. 1 - Investment opportunities by stages of the life cycle.

The stage of a company's life cycle is determined by the rate of change in indicators (Figure 1).

Conclusion. Assessing the business processes of a company is an integral evaluation of its capabilities as an object for future investment from the perspective of development prospects, product sales volumes, asset utilization efficiency, liquidity, solvency, and financial stability. Several factors have been identified that influence the economic efficiency of business processes: the company's investment policy, investment programs and strategy, the presence of competitive products, production diversification, enterprise management, rational asset utilization, and the completion degree of investment projects.

The methodology for evaluating the improvement of a company's business processes is based on methods and techniques of investment opportunities and financial analysis. It is necessary to use a set of financial indicators that quantitatively and accurately assess the attractiveness of the company. Various financial ratios can be used to evaluate the attractiveness of business processes and further investment. These indicators can be used to identify the dynamics and trends of the indicators, as well as to compare them with planned and benchmark indicators. Typically, their composition is determined based on the goals and depth of financial analysis.

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