

FORMATION AND DEVELOPMENT OF THE INNOVATION POTENTIAL OF THE COMPANY'S EMPLOYEES

FORMAÇÃO E DESENVOLVIMENTO DO POTENCIAL DE INOVAÇÃO DOS FUNCIONÁRIOS DA EMPRESA

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Abstract: This article explores the innovation potential of industrial company personnel. The relevance of the research is confirmed by the growing interest of companies in innovation. This is manifested both in the change in the organizational structure of companies and in a new approach to human resource management, for example, the review of key employee performance indicators. One of the main objectives of the research was to determine the factors that influence the development of employees' innovation potential and to assess their impact. The institutional approach constituted the conceptual basis of the study. The research results allowed the authors to make recommendations for training and developing the innovation potential of the company's employees.

Keywords: Innovation. Innovation Potential. Human capital. Human Resources Management. Organization.

Resumo: Este artigo explora o potencial de inovação do pessoal de empresas industriais. A relevância da pesquisa é confirmada pelo crescente interesse das empresas pela inovação. Isso se manifesta tanto na mudança da estrutura organizacional das empresas quanto em uma nova abordagem para a gestão de recursos humanos, por exemplo, a revisão dos indicadores-chave de desempenho dos funcionários. Um dos principais objetivos da pesquisa foi determinar os fatores que influenciam o desenvolvimento do potencial de inovação dos colaboradores e avaliar o seu impacto. A abordagem institucional constituiu a base conceitual do estudo. Os resultados da pesquisa permitiram aos autores elaborar recomendações para a formação e desenvolvimento do potencial de inovação dos funcionários da empresa.

Palavras-chave: Inovação. Potencial de Inovação. Capital Humano. Gestão de Recursos Humanos. Organização.

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Introduction

Modern economic challenges underlie the increasing interest of enterprises in innovation. The efficiency of the latter, in turn, it is based on the company's ability to form, develop, and use the innovation potential of its employees.

Understanding the essence of innovation, assessing the innovation potential of the company and its employees, and human resources management are what enables the company to develop unique products, thereby increasing its competitiveness, flexibility, and ability to promptly respond to market changes.

Therefore, improving theoretical and methodological approaches as well as practical recommendations for managing innovation potential are especially relevant.

The research goal was to analyze the development of the innovation potential of employees at industrial enterprises and to develop scientifically sound recommendations for its formation and development. To achieve this goal, we set the following research objectives:

- To analyze organizational, administrative, socio-psychological, and economic factors that affect the innovation potential of employees and to assess their influence;
- To determine the prospects for the creation of techniques aimed at the formation and development of the innovation potential of employees;
- To identify the problems of the formation and development of the innovation potential at two levels: in a company and by an employee;
- To analyze the system of the development of the innovation potential of employees on the example of two St. Petersburg industrial enterprises;
- To devise recommendations for the formation and development of the innovation potential of the company's employees.

The scientific novelty of the research includes the substantiation of approaches to the formation and development of the innovation potential of employees at an industrial enterprise, the study of the specifics of innovation policy, and the identification of growth and development areas.

Literature review

International researchers began studying the issue of innovation in the 20th century (ROMERA, 1988; VELEN, 1984; SOLOW, 1957; SCHUMPETER, 1982; CHRISTENSEN, 1997). For instance, J. Schumpeter first introduced the economic concept of innovation as a combination of production methods that can bring commercial benefits, which imply creation of new goods, use of new materials and sources of raw materials, introduction of a new production method, and the opening of new markets.

In Russia, L. S. Baryutin (2000), N. D. Kondratyev (2002), Yu. V. Yakovets (2015) and other researchers explored the issue of innovation. They described the cycles and mechanisms of the impact of innovations on state development, as well as the problems associated with updating the production facilities.

E. A. Pavlova (2007), M. Smith (2008), and Ph. Ball (2006) considered various impacts on the effectiveness of the formation of innovation potential. For instance, Marisa Smith proposed a conceptual model of internal factors for the formation of innovation potential. This model includes technology, knowledge management, innovation, culture, corporate strategy, staff, the organization structure, management style, resources, and leadership. E. A. Lapteva (2014), O. A. Lezina (2015), and N. S. Knyazeva (2012) examined various aspects of the management of the innovation potential of an enterprise.

Russian researchers consider the innovation potential of enterprises from two perspectives. The first one focuses on the effective approach. It implies that the enterprise is ready to implement innovative projects due to qualitative transformations during innovative development (BABANOVA,

2007; VASYUKHIN, 2010; ZHELNINA, 2015). For instance, according to E.V. Zhelnina, the internal ability of an enterprise to deliberately develop a new product and attract resources is a characteristic of innovation potential.

The second approach considers innovation potential with the focus on content and resources. That is, it prioritizes the total resources required for innovative activity and their sufficiency under the influence of the external and internal environment (PUSHKARENKO, 2011; BELYAKOV, 2010; ZINCHENKO, 2005). These approaches, they should be supplemented and adjusted for most efficient application in modern conditions of digitalization and informatization.

METHODOLOGY AND METHODS OF RESEARCH INTO THE INNOVATION POTENTIAL OF EMPLOYEES AT INDUSTRIAL ENTERPRISES

This article presents the results of studying the innovation potential of two St. Petersburg industrial companies. To carry out the research, we used the methods of in-depth interviews, expert assessments, and the qualitative analysis of documents. We relied on the following provisions of Ph. Kotler's concept of managing a commercial enterprise (1969):

- The concept of production improvement, according to which companies should try to increase efficiency. In this case, the developed innovation potential is one of the ways to achieve this goal, since the ideas of employees working in production mainly aim to improve the work process (modernizing the equipment, reducing time losses, and increasing operations efficiency), which increases the efficiency of production;
- The concept of product improvement, according to which companies should seek to improve their products on a regular basis. Therefore, the management of innovation potential should consist of projects and specific activities that stimulate the search of innovative ideas.

Exploring the economic concepts, we would like to note the Major Cycles of N. D. Kondratyev (2002). The researcher did not analyze innovation processes, but his conclusions formed the basis for the theory of innovation developed by J. Schumpeter (1982).

According to the concept of innovative management, in this study, we applied a systemic and project-based approach.

We considered the management of innovation as a complex hierarchical socio-economic and scientific-technical system consisting of a functional unity of elements and subsystems, as well as the organization of the development and implementation of innovations in the form of innovative projects. In addition to this, the institutional approach underlies the conceptual design of this study. This approach allowed us to consider the management of innovation potential as a special mechanism for achieving sustainability, stable development of an enterprise, and its strategic success as a whole. We defined innovation potential as a set of characteristics of a socio-economic system (in this research – an enterprise), which determines its ability to generate, implement, and promote new ideas and technologies.

We analyzed the system for the development of the innovation potential of employees at industrial enterprises using expert assessments obtained in an interview. We identified five groups of stakeholders (Table 1):

Table 1. Responsibilities and the area of expert assessment of the respondents.

No	Department Responsibilities	Representative, job title	Area of expert assessment
1	Selection and hiring of new employees, as well as dealing with personnel issues	HR manager	Assessment of the innovation potential of the applicants, attracting innovation-driven personnel, keeping track of innovative activity when calculating bonuses and incentives.
2	Personnel training and development, corporate culture	Training and Communication Specialist	Conducting training programs to boost the innovation potential of employees; Implementing projects to increase the staff's motivation and involvement in innovations; Developing innovation potential in the corporate culture.
3	Engineering Department: implementing improvement ideas	Head of the Engineering Department	Creating an efficient organizational structure for working with improvement ideas; Issuing orders and instructions that regulate the implementation of improvement ideas; Assessing the company's readiness for innovation.
4	Production department: submitting improvement ideas	Production Manager	Providing tools to foster submission of improvement ideas; Implementing projects to increase the motivation and involvement of staff in innovation; Creating teams of employees working in R&D.
5	Economy Department: financial planning of the implementation of improvement ideas.	Manager of the Economy Department	Principles of financial planning for the implementation of improvement ideas.

Source: Search data.

We formulated the interview questions according to the field of the expertise of the respondents, while the following aspects of the issue under study were the same for all of them:

- The relevance of the development of innovation potential for employees of industrial enterprises;
- The role of the innovation potential of employees in the sustainable and stable development of an enterprise and the strategic success of the company as a whole;
- Tools for assessing, forming, and developing the innovation potential of employees;
- Organizational, administrative, socio-psychological, and economic factors that affect the development of the innovation potential of employees;
- Prospects for the development of technologies aimed at the formation and development of the innovation potential of employees.

The method of expert interview has some advantages. For example, it allowed us to obtain

information from specialists who assess, form, and develop the innovation potential of staff both at the employment stage and during work. This method enabled us to identify the aspects of the problem under study familiar to only those involved in the process. What is more, interviewing professionals, we managed to test the existing hypotheses and assumptions and to obtain information from the respondents who could not take part in other forms of surveys due to high workload and administrative barriers.

The method of expert assessments allowed us to determine the significance of the development of innovation potential of employees at industrial enterprises, to evaluate the organizational, administrative, socio-psychological, and economic factors that influence its development, as well as to assess the prospects for designing the methods for assessing, forming, and developing the innovation potential of employees.

Having analyzed the internal documents regulating the innovation policy of the enterprise, we determined the organizational structure of the innovation management and the stakeholders. Thus, we could propose targeted recommendations and determine the ways of improving the system for developing the innovation potential of the staff.

Research hypotheses:

- The effective use and development of the innovation potential of employees at industrial enterprises is crucial for the sustainability, stable development, and strategic success of the enterprise.
- A rational organizational structure of innovation management should reflect the factors crucial for the development of the innovation potential of employees.

Results

We obtain the research data by studying two light industry enterprises (factories) in St. Petersburg. Conducting the study, we made the models for innovation potential management in these companies.

Company 1 created the Focused Improvement Pillar Department to manage its innovation potential. This department consists of process engineers responsible for the continuous analysis of the enterprise performance. They supervise both production machines and the entire production lines, as well as the operation of service departments—mechanics, logistics, and offline maintenance. The engineers collect data on production losses, and then devise projects to eliminate major losses.

This process involves employees who work on the production line, as they are most familiar with the equipment and everyday challenges. This means they can provide valuable information for the development of an innovative project. Therefore, process engineers work with innovative ideas of production employees on a regular basis. For this purpose, the company created the necessary infrastructure – a special mobile application, in which employees can contribute their innovative ideas. This app allows attaching photos and videos, as well as feedback forms so that employees may read the comments of process engineers on their ideas and see their status (“Approved,” “Rejected,” or “Refine”).

Every two weeks, the representatives of all interested departments (the Improvement Ideas Committee) consider the approved suggestions. After a final discussion and a decision about the project launch, they nominate the author of the idea for a prize, the size of which directly depends on the economic effect of the implemented improvement.

In Company 2, the heads of the departments are responsible for managing the innovation potential of employees. Shift supervisors are the line managers of production employees. The employees are to analyze the efficiency of the line operation during every shift. For this, the company developed evaluation checklists. The employees should explain all losses of time, speed, and products recorded during the shift using the five Whys analysis tool and propose at least two ways of dealing with the losses. The information collected discussed at daily operational meetings of the production staff. They decide to launch innovative projects. The employees who contributed many ideas for reducing production losses receive quarter bonuses.

Once a quarter, the company organizes workshops for production employees to develop

innovation potential and improve the application of analysis tools.

Twice a year, the company conducts the START Initiatives Accelerator for the staff of other departments. It selects the best innovative ideas, and their authors receive valuable prizes and the opportunity to participate in the implementation of the project.

During the interview, the experts considered these two models and described the organizational, administrative, social, psychological, and economic factors influencing the development of the innovation potential of employees at industrial enterprises (Table 2).

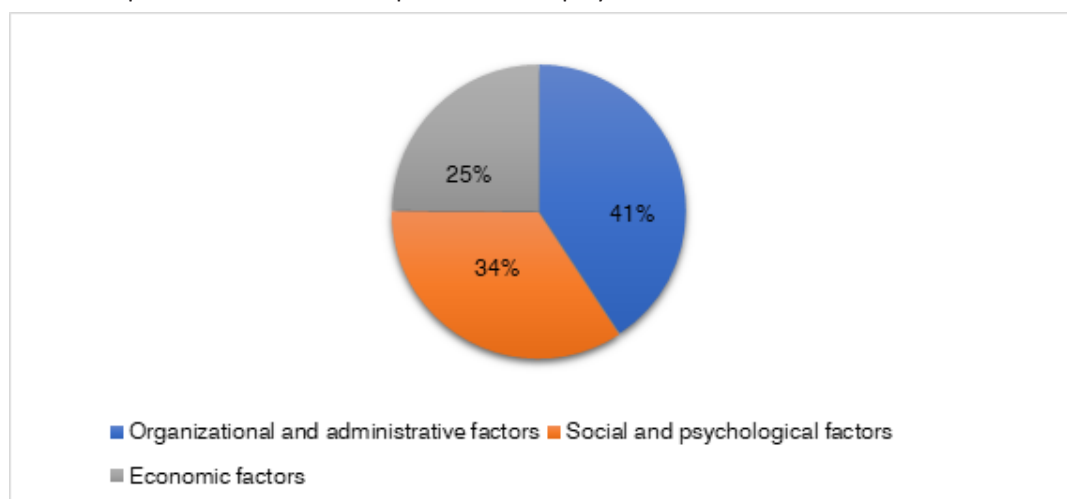
Table 2. Factors affecting the development of the innovation potential of employees at industrial enterprises.

Group of factors	Factors
Organizational and administrative	Organizational structure of management; organizational and functional delegation of authority, the level of a learning culture; communications system: availability of information, working conditions; enterprise resource planning and management; innovation strategy; the procedure for making strategic decisions; infrastructure for submitting and considering innovative ideas.
Social and psychological	Professionalism; motivation for innovation; personal qualities of employees; readiness for training and retraining; current knowledge and skills; development of soft and hard skills; willingness to take risks; motivation and incentives for the employees for innovation; the level of the corporate culture and the working climate.
Economic	Wage payment system; financial incentives for innovative activity; financing of innovative projects; facilities and resources of the enterprise.

Source: Search data.

Next, as part of the method of expert assessments, we asked the respondents to assess the influence of three groups of factors (organizational and administrative, social and psychological, and economic) on the formation and development of the innovation potential of employees (Fig. 1).

Figure 1. The assessment results of the influence of three groups of factors on the formation and development of the innovation potential of employees

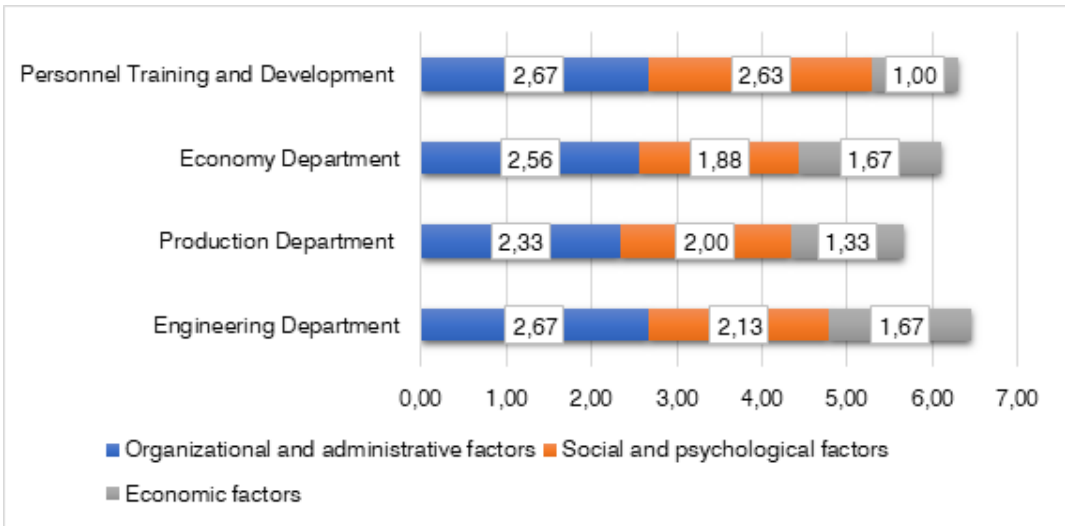


Source: Search data.

According to the experts, organizational and administrative factors had the strongest influence on the formation and development of the innovation potential of employees: the average score for this group was 2.56 out of 3.0, or 41%. The social and psychological ranked second, while economic factors ranked third 2.16 (34%) and 1.56 (25%), respectively.

The values distribution by department was as follows (Fig. 2):

Figure 2. The assessment results of the influence of three groups of factors on the formation and development of the innovation potential of employees (by department)



Source: Search data.

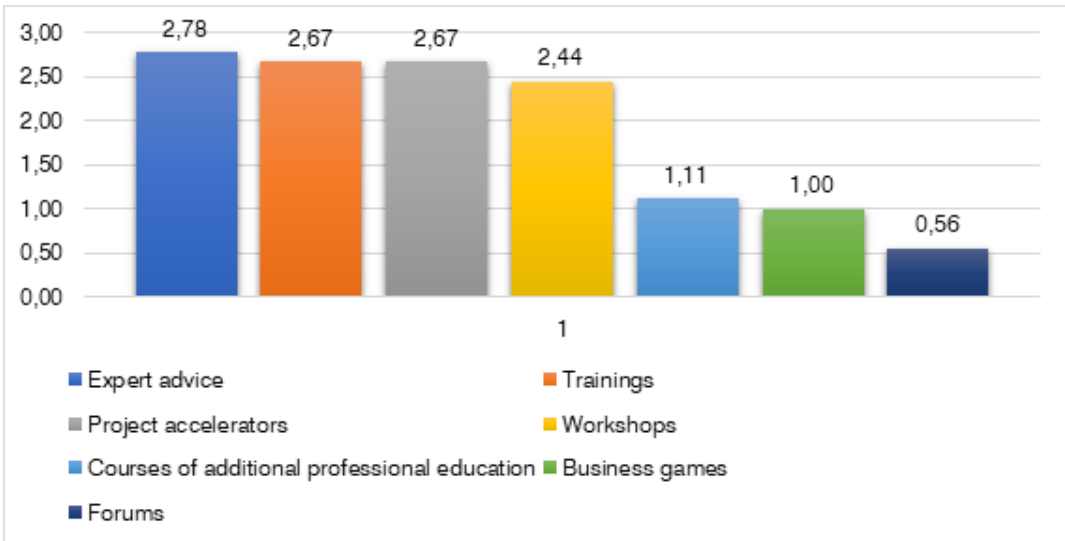
According to the experts, the most significant factors were the infrastructure for submitting and considering innovative ideas; wage payment system; communications system, that is availability of information; the level of a learning culture; planning and management of enterprise resources.

The following factors had the least influence on the development of the innovation potential of employees: the procedure for making strategic decisions, financing of innovative projects, and willingness to take risks.

In addition to this, the respondents identified tools for the formation and development of the innovation potential of employees at industrial enterprises. These include courses of additional professional education, workshops, business games, seminars, forums, expert advice, and project accelerators. Each of these methods may be applied both online and offline.

The experts assessed how effective these methods are for the formation and development of the innovation potential of employees at industrial enterprises (Fig. 3).

Figure 3. Assessment of the effectiveness of these methods regarding the formation and development of the innovation potential of employees at industrial enterprises.



Source: Search data.

The chart demonstrates that the experts gave the maximum average score (2.78 out of 3.0) to expert advice. During the interview, they noted that the consultations of the engineering team,

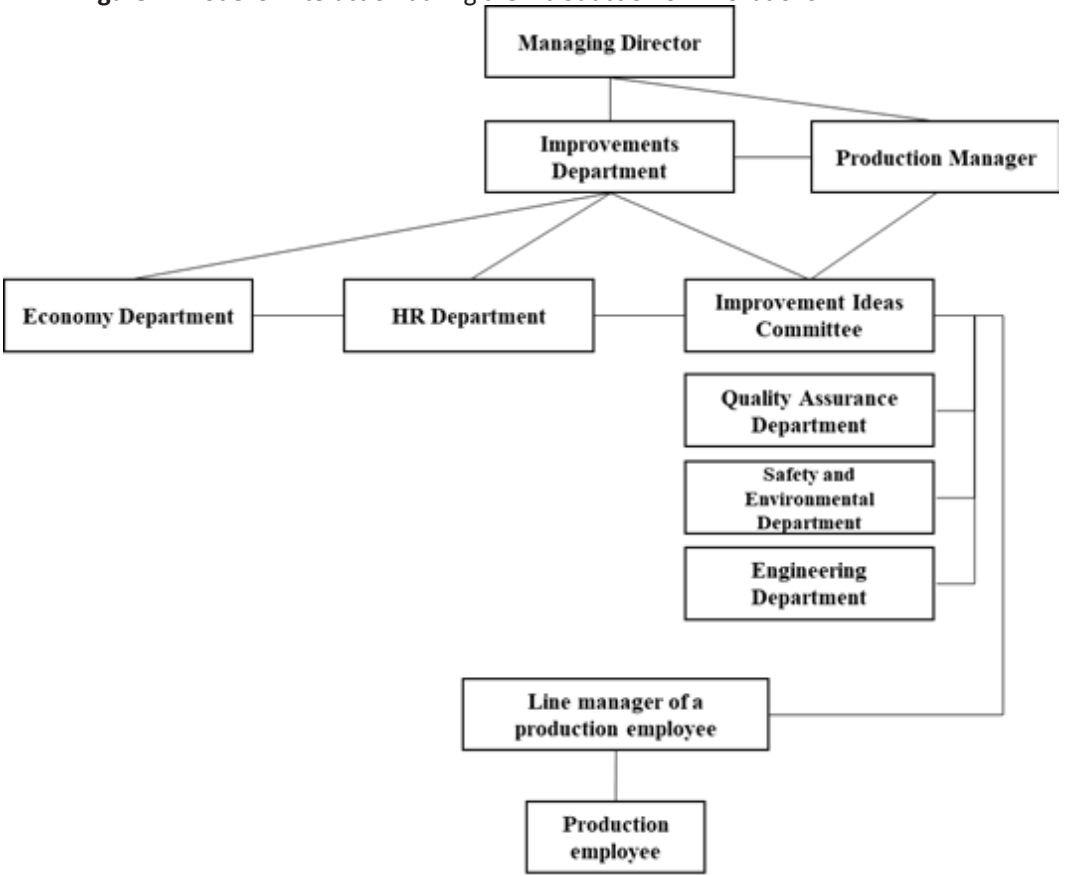
as well as the representatives of the Quality Assurance and Safety Departments, both increased the motivation of employees for innovation and stimulated the elaboration of innovative ideas. Such meetings included a discussion of best practices and a detailed analysis of proposed innovations. It has been having analyzed the expert advice given, it was possible to create a list of ideas to be implemented by process engineers.

According to the experts, effective techniques for the formation and development of the innovation potential of employees are trainings and project accelerators (2.67 points), as well as seminars (2.44). Such methods imply giving a sufficient number of practical exercises, while project accelerators also allow developing and refining particular innovative proposals.

Forums, business games, and courses of additional education ranked lowest (1.11, 1.00, and 0.56, respectively). The main reason is the low efficiency of these methods due to the specifics of an industrial enterprise. In this case, one of the crucial conditions for personnel development is to minimize the time when employees do not work in production, and the methods listed above do not meet this requirement.

Another issue discussed in the expert interview was the effective organizational structure of innovation management. Based on its results, we devised a model of interaction when implementing innovations (Fig. 4).

Figure 4. Model of interaction during the introduction of innovations.



Source: Search data.

As we can see in Figure 4, the main contact person for the production employee is the line manager, who is to provide feedback. The line manager should submit the employee's innovative proposals to the Ideas Committee, which includes Quality Assurance, Safety and Environmental, as well as Engineering Departments. The Improvements Department conducts the Idea Committee meetings. HR and Economy Departments provide consultations and support on human capital development programs.

Discussion

While conducting the research, we collected opinions of experts on the factors constraining and contributing to the development of innovation potential. They named such constraints as insufficient funding for innovative projects, lack of an innovative strategy, an authoritarian management style, insufficient interaction between departments, bureaucratization of innovative activities coordination, and sanctions imposed if targets are not achieved. In addition to this, the experts noted the impact of the human factor, namely, the personnel's resistance to changes in familiar activities.

According to the experts interviewed, the factors increasing innovation potential are stable and regular investments in the development of innovative projects, modern resources and facilities, and staff motivation for both personal and enterprise development. The experts highlighted the significance of a good learning culture and a developed system of material incentives (bonuses).

According to the experts, the enterprise must create an open and transparent system for submitting innovative ideas and facilitate innovation by giving the opportunity to participate in the discussion: it should provide information about projects and proposed innovations. This can be done at open meetings of the Ideas Committee, by providing information on the stands and in publications in the corporate press. The enterprise should enable its employees to exchange expertise with other businesses and to introduce best practices. In addition to this, the company should allocate resources to provide consultations with key specialists on innovation.

Conclusion

Having conducted the research, we drew the following conclusions:

- Organizational and administrative factors have the greatest influence on the formation and development of the innovation potential of employees;
- According to the experts, the most significant factors increasing innovation potential are the development of the infrastructure for submitting and considering innovative ideas, the bonus system that reflects the employees' participation in innovation, and the availability of information about innovations;
- The constraining factors are insufficient funding, lack of an innovative strategy, authoritarian management style, bureaucratic approval process, and sanctions imposed if targets are not achieved;
- At an industrial enterprise, the most efficient method for developing innovation potential is expert advice. Such support increases the employees' motivation for innovation and improves the quality of innovative ideas;
- An effective organizational structure for managing innovation implies that there are people responsible for feedback and ideas implementation. They are line managers and the Improvement Department.

To manage the innovation potential of employees at industrial enterprises, we propose the following recommendations:

- The meetings of the Improvement Ideas Committee should be held at least every two weeks. The meetings should be public: both the authors of the ideas and any interested employees may attend one. Line managers should provide production employees with the minutes of the meetings;
- The communications system should allow posting information on consideration and implementation of innovative projects. This information should be available on the stands in production departments and TVs in recreation areas;
- Ideas should be submitted and considered through modern digital tools – mobile and

tablet apps. This will reduce barriers: employees will be able to participate in innovations without leaving their workplace;

- The company should create an Improvement Department responsible for organizing the process of innovation;
- To increase employees' motivation to participate in the development of the enterprise, the performance indicators should include quarter or annual bonuses for innovative activity. This may refer to the number of approved innovative ideas and projects in which the employee took part. These indicators should be based on the classification proposed within Kaizen – the Japanese system for improvement. In this system, the status of an idea depends on the potential economic effect, which will result from the implementation of this idea;
- The work schedule of the departments involved in the implementation of innovative ideas (Engineering, Quality Assurance, and Safety Departments) should allocate time for consulting employees on innovative activities;
- To increase employees' knowledge and skills required for the development of innovation potential, the company should conduct trainings, project accelerators, and workshops at least twice a year. New employees should undergo compulsory training in the programs on innovative ideas and get familiar with the organizational structure.

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