

Promising directions for improving production using innovative achievements

Lalita Idigova^{1,2}, Huseyn Chaplaev³, and Kazbek Mazhiev^{1,2,*}

¹ Chechen State University named after A.A. Kadyrov, 32, Aslanbek Sheripov Str., Grozny, 364024, Russian Federation

² Kh. Ibragimov Complex Institute of the Russian Academy of Sciences, 21a, Staropromyslovskoe highway, Grozny, 364051, Chechen Republic, Russian Federation

³ Chechen State Pedagogical University, 62, Kh. Isaev Ave., Grozny, 364068, Russian Federation

Abstract. The paper is devoted to the study and development of an innovative strategy for the organization of production activities at enterprises for the economy sustainable development. It is noted that innovative strategies in the production process should be aimed at maintaining the traditional competitive advantage and creating an innovative competitive advantage. The economic approach to the content of innovations is essential; it implies the definition of innovations through their relationship with the economic sphere as a whole. Scientific and technological progress increasingly predetermines the degree and speed of development of industrial enterprises. It covers all parts of the innovation process, including fundamental theoretical research, applied research, design and technological development, the creation of new technology samples, its extension and industrial production, as well as its implementation into the national economy. The formation of economic processes at enterprises is directly related to the application of advanced technologies. Owing to innovative technologies, there is a multiple increase in labor productivity, materials with new physical and chemical properties appear. Innovations are one of the causes generating crises at various levels of the progress of socio-economic structures in contemporary production. Their realization should be carried out in combination with technological, organizational, financial, and personnel restructuring based on the conceptual growth of an industry or enterprise.

1 Introduction

Improving production implies a transition from non-reproducible growth factors to reproducible ones. The objective need to intensify innovation processes is determined by the characteristics and needs of industrial development. Innovations are considered the most significant component of the enterprise financial development. They have an ambiguous effect on the economic growth dynamics: on the one hand, they open up new opportunities, on the other hand, they make it impossible to continue this growth in traditional directions. Innovations destroy the economic balance, introducing disturbance and uncertainty into economic dynamics, and the regularity of their occurrence causes cyclicity in economic enhancement. As practice shows, the leader focuses on an innovative idea when he realizes that the product he is creating will soon become obsolete. Digital transformation is singled out as an essential national aim among others [1].

The paper topic is related to promising areas for improving production using innovative achievements. The main directions of the country's economic development are: improving the quality characteristics of manufactured products, reducing its cost, increasing labor productivity. A significant expansion of the technical re-equipment scale of operating enterprises, equipping them with new highly

efficient technique, the introduction of advanced technologies and modern management methods are the most urgent tasks of scientific and technological progress. The basic task is seen in the creation of something completely new, different from the previous one. The relationship between scientific and technological progress and the innovation process can be traced in the above mentioned interpretation. [2]

The purpose of the study is to investigate the issues and prospects for the introduction of innovative achievements in production.

The methodological basis of the study is the principles and methods for solving issues and prospects to improve production applying innovative achievements.

2 Materials and Methods

Research methods represent a set of techniques and operations for the manufacture of products, or the provision of services performed with a certain combination of elements of the production process. An innovation in the production organization is a completed outcome of creative activity to be introduced to the market or to other areas, depending on the purpose. The new outcome presented in the manuscript is as follows: the decision to include innovation in the innovation strategy of an enterprise should be based on the results of an assessment according to the

* Corresponding author: maret_fil@mail.ru

relevant criteria, considering the dynamics determination of costs, efficiency and risks of innovation in the production organization. The innovative strategy formation for the production organization is to include an analysis of the current and possible state of its innovative potential at various time intervals – the period for which this innovative strategy is designed.

3 Results and Discussion

Scientific and technological progress in recent years covers all parts of the innovation process, including fundamental theoretical research, applied research, design and technological developments, the creation of samples of new technology, its progress and industrial production, as well as its introduction into the national economy. The production organization at the enterprise provides for the integration of all elements of the production process into a common process, contributes to the achievement of their optimal interaction in order to ensure the production economic efficiency. The production organization acts as a vector of the enterprise productive activity, since it contributes to an increase in labor productivity, the release of a quality product, the rational use of resources, and the development of organizational culture and personnel in the course of production activities [3]. The tasks of organizing production are aimed at saving labor resources by streamlining interactions in the production process, increasing the creative nature of the work of employees and providing full interest in the work outcomes. Besides, an essential aim is the implementation of the required conditions for the execution of all ways of the enterprise production activities. Optimization production ways largely depend on the scientific and technical profile of the enterprise. Most organizational issues can be resolved only on the basis of deep knowledge of the technological processes used at the enterprise, the features of equipment and tooling, the technological and design characteristics of the product. In the current realities, there is an increasing need for online education, which, accordingly, has given rise to many online universities and various courses offering advanced training in online format [4]

Innovative technologies are the major priority area of state support for manufacturing enterprises. Russia remains the world leader in developments in the field of chemistry, physics, medicine, and aerospace engineering, therefore innovative technologies should be available and applicable at domestic enterprises, and specialists implementing innovations should be interested in the correct and timely use of advanced technologies. Innovation management in the production organization is associated with the formation and application of an innovation system for the implementation and dissemination of new knowledge, technologies and products within the same region at enterprises [5].

The main premise of the innovative activity of a modern enterprise is that everything becomes obsolete. Therefore, it is necessary to regularly replace the technologies that become obsolete, hindering progress. It is extremely

significant to control the quality of products, state of jobs, compliance with technologies, and analyze the market and distribution channels from time to time. In other words, monitoring of all aspects of the enterprise's activities should be carried out. As practice shows, the leader focuses on an innovative idea when he realizes that the product he is creating will soon become obsolete. In a broad sense, innovation is understood as new technologies, types of services, products, organizational and technical solutions of an industrial, administrative, financial and other nature. Innovations are considered the most crucial component of the financial enhancement of an enterprise. They have an ambiguous effect on the economic growth dynamics: on the one hand, they open new opportunities, on the other hand, they make it impossible to continue this growth in traditional directions. Innovations destroy the economic balance, introducing perturbation and uncertainty into economic dynamics, and the regularity of their occurrence causes cyclicity in economic development [6].

In our opinion, innovation is a completed outcome of creative activity to be introduced to the market or to other areas, depending on the purpose. The concepts of “innovation” and “innovation process” should be clearly distinguished, despite the relationship. The innovation process in its most general form is the process of creating, assimilating and disseminating innovations. The starting point of the innovation process is often the presence of a well-defined problem, for which the innovation project is initiated.

On the other hand, the company accepts many interesting ideas in the field of innovation, despite the fact that these ideas do not see certain problems, but their implementation can significantly be advanced in the competition. For instance, if customers are satisfied with an existing product and do not comprehend the reason for dissatisfaction, but at the same time, improving this product and expanding its functionality can increase demand for it. [7]

Every innovative company has its methods and features for generating and selecting ideas. At the first stage, as a rule, spontaneous ideas predominate, often having a very remote relation to the aims and objectives of the company. Particularly, the given method is encouraged by the method of “brainstorming.” These ideas can be rarely efficient and useful for the organization, because they need to be finalized and “brought to mind.” This is one of the most significant steps in creating innovation, as it defines the further course of the innovation process (Fig. 1). [8].

The next stage involves the product concept development that describes all the characteristics of the future product. The concept should answer the question about the focus of this product, advantages in comparison with competing products, and should also contain a detailed description of the functional and technical properties of the product, its design. The product concept is the outcome of bringing the general idea to the product, and the concept should be tested for compliance with the results of marketing research. Tested concepts are accepted by management for implementation, and the rest are eliminated.

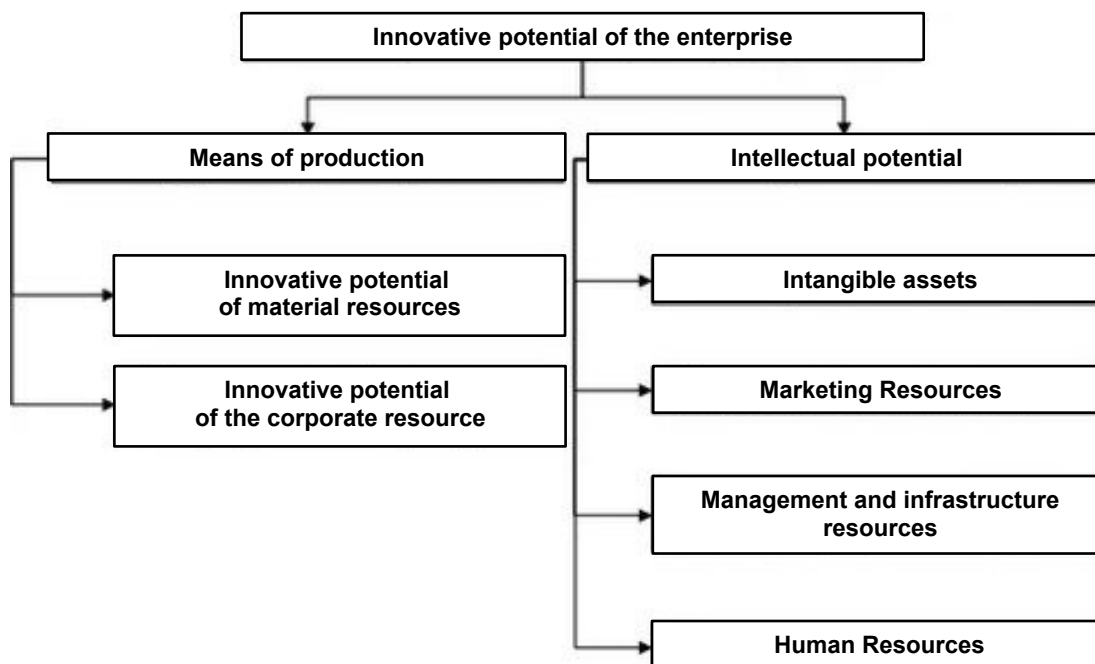


Fig. 1. Features of generating and selecting ideas of an innovative company

The result of this stage is the compilation of the documents' package that reflect the product concept. These documents are sent to the design department, where the construction and development of the innovation takes place. An innovation computer model is usually created at the development first stage. The prototype is created after the model is designed. Then, the testing and experimentation phase take place. The new product is tested for safety, its technical characteristics and usability are checked, the opinion of consumers about the new product is studied, and each innovator is assigned a role. This trend is clearly manifested in a surge of inventive activity and leads to the implementation of a mass of innovations. A considerable share of merit in the study of innovation in the context of teamwork belongs to the American expert Andrew Hargadon. Thomas Edison's success is more determined by the knowledge and skills of his workers than by his own, dispelling the well-known stereotype of exceptional merit in the inventions that come out of his laboratory when he writes about the organization of his laboratory and like-minded people who work with a wide variety of projects and tasks [9].

The history beginning of industrial automotive construction falls on the end of the 19th century. Many technological innovations in the field of business organization, which were quickly adopted by other types of mass production, were created in the automobile company of Henry Ford. For example, the conveyor method of production, which to this day occupies the main place in the world industry, was first applied at this plant [8]. At the initial stage, the activities of industrial companies were mainly aimed at the practical application of the existing knowledge base, and not the creation of new ones. However, many of the management principles have had a very fruitful impact and innovative management. Strengthening the specialization of labor and the trend of delegating management functions by management is the basis for controlling innovations. Thus, the management of such routine organizational processes as production, personnel

management, logistics, and sales, has significant differences from the management of innovative processes [10].

A significant part of managerial powers is concentrated at the highest levels of management in highly centralized structures, while in decentralized structures, many essential decisions are made by middle and lower levels of management, as well as ordinary employees. Innovations are generally divided into incremental and radical in terms of scale and impact on the market environment. Incremental are called supporting, improving; they enhance existing products and services without great changes. Radical (breakthrough, basic) create completely new products and business models, radically changing existing markets, or creating completely new ones. Two categories of innovation are distinguished in Western literature: technological innovation and innovation in business models. The first category includes innovations in products, technological innovations in production processes, logistics, and sales. The concept of a business model is quite broad [11].

J. Schumpeter's research covers mainly the macroeconomic aspects of innovation, and further development of the designed theory is eventual through the refinement of behavioral strategies of groups of economic entities, namely, innovators and conservatives. Thus, monitoring the life cycle of individual clusters can serve as a more accurate indicator of the emergence of major industry or regional transformations. One of the basic signs of innovation is the focus on creating new needs that do not correspond to market trends [12].

The development of innovations in the process of organizing production should include completely diverse approaches and principles of management, and become an essential stage in the innovative science development. Various authors offer own ways of solving the issues of companies losing their ability to implement radical projects. One of the main issues is the problem of delimitation of functions between the organization basic structure and a specialized team: processes of the main structure are very efficient within the framework of the tasks being solved, therefore, it makes sense to transfer part of the major

organization functions according to the outsourcing principle, depending on the radical project specifics and the set tasks. It is necessary to consider the technological side of innovation in a more in-depth study of innovation management. Innovations can affect both the entire product as a whole and its individual components [12]. Changes in the combination and relationship of existing components also contain novelty. Researchers T. Davila and M. Epstein consider 3 categories of innovation: incremental, semi-radical and radical. According to the model, radical innovations should be based on completely new technologies and business models [13].

An innovation is considered “half-radical” when one of the two elements has a low degree of novelty, while the changes in the other are much more pronounced. Rebecca Henderson and Kim Clark offer a model of 4 types of innovations that differ in two parameters: changes in individual components (improvement or radical restructuring) and changes in the combination of these components: incremental [14]. They comprise only improvements to individual components, without changing their interaction. Minor changes in individual gadget functions can be attributed to their number:

- modular. This type involves a cardinal change of individual components, while their place in the system remains the same. The electric motor, for example, is the component that has led the automotive industry to modular innovation;

- architectural. The order and ways of the components' interaction change. An example of such an innovation is a motorcycle, which did not require the invention of individual components;

- radical. The invention of the incandescent lamp has completely changed the way we light rooms. First, a key component was redesigned when the filament was introduced. Second, another source of energy appeared - electricity.

4 Conclusion

Researching the reasons of leading companies lag with the appearance of new industry technologies is a significant topic in the works of promising experts. The short-sightedness of top management, unable to build an innovative strategy for organizing production in accordance with market and industry conditions, is called one of the most crucial reasons. However, the experts agree that such a policy leads to a loss of the organization's ability to create radical innovations, since the development, management, and budgeting processes are more suitable for incremental innovations. The economy transition to an innovative socially oriented development model is the basic direction for achieving the aims of sustainable growth. Innovation is becoming a factor of economic and social enhancement. Investing in the innovation sector means the driving force behind the long-term development and sustainable growth of the country's economy.

The innovative development of a manufacturing enterprise can be fully called the trend of the times. The extension of own production and the competitiveness of goods are possible only in the case of the innovations' implementation in

the enterprise. They allow ensuring maximum profit, and maintain and strengthen the image.

References

1. L.M. Idigova, B.H. Rahimova, Development of small and medium-sized businesses in the context of digital transformation. *FSU Sci.* **4** (2021)
2. H. Endryu, *Innovation management. Experience of leading companies* (Williams, 2007) ISBN: 5845909411, 1578519047
3. R.M. Henderson, K.B. Clark, Special Issue: Technology, Organizations, and Innovation. *Adm. Sci. Quart.* **35(1)** (1990)
4. D.E. Bowen, C. Ostroff, Understanding HRM-Firm Performance Linkages: The Role of the “Strength” of the HRM System. *Acad. of Manag. Rev.* **29(2)**, 203–221 (2004). Retrieved from: <https://psycnet.apa.org/doi/10.2307/20159029>
5. P.-M. Dechamps, Le capitalisme peut-il se racheter? *Problèmes économiques* **3035**, 42–48 (2012)
6. J. Fagerberg, *Innovation: a guide to the literature* (2004)
7. H. Ford et al., *About investments and stock exchanges* (Moscow, Ripol Classic, 2022)
8. J. Shumpeter, *Economic development theory: a study of entrepreneurial profit, capital, credit, interest, and business cycle*. Transl. from Germ (Moscow, Progress, 1982)
9. L.M. Idigova, Features of innovation activity in the context of economic globalization. *Sci. and anal. J. Bull. of Chechen State Univ.* **4** (2019)
10. C. Freeman, *The economics of industrial innovation* (Leningrad, Pinter, 2010)
11. J. Utterback, W. Abernathy, *A dynamic model of process and product innovation*. Retrieved from: https://scripts.mit.edu/varunag/readinggroup/images/f/f6/Utterback_Abernathy_A_dynamic_model_ofprocess_and_product_innovation.pdf
12. T. Davil, M.Dzh. Epshtejn, R. Shelton, *Working innovation. How to manage it, measure it and benefit from it* (Dnepropetrovsk, Balance Business Books, 2007) ISBN: 978-966-415-009-2
13. R.M. Henderson, K.B. Clark, Architectural Innovation: the Reconfiguration of Existing Product Technologies and the Failure of Established Firms. *Adm. Sci. Quart.* **35**, 9–30 (2012)
14. T.M. Gardner, P.M. Wright, L.M. Moynihan, The impact of motivation, empowerment, and skill-enhancing practices on aggregate voluntary turnover: The mediating effect of collective affective commitment. *Person. Psychol.* **64(2)**, 315–350 (2011). Retrieved from: <https://doi.org/10.1111/j.1744-6570.2011.01212.x>