### Innovation as an Integral Component of Industrial Organization Management: Developing and Implementing an Effective Methodology

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#### Abstract

Innovation is defined as a change that enhances process efficiency and improves the quality of market-demanded products. Innovations are classified based on various criteria, such as the timing of emergence, reasons for emergence, application nature, and impact scale. The author focuses on external factors influencing innovative development, including economic conditions, legal regulations, technological advancements, market environment, human capital, and infrastructure. Internal factors, such as technological base, management practices, corporate culture, and financial resources, are also highlighted. The article examines innovation models like linear, network, and open models. It provides examples of strategies and practices for implementing innovations in the industrial sector across different countries-Germany, Japan, and the USA. In this context, the article presents an approach to addressing current innovation challenges through the development of an effective methodology aimed at integrating innovative activities into all aspects of an industrial organization's operations. The program includes a skills audit, development of training modules, project assignments, mentoring, and systematic progress monitoring. Its goal is to cultivate the technical and strategic skills necessary for success in the modern digital economy. Overall, the article offers valuable research material for management and innovation fields, as well as for industrial managers seeking to enhance their employees' competitiveness and sustainability in the current market conditions.

**Keywords:** innovation, industrial organizations, technological development, economic conditions, innovative development models.

**JEL classification:** L26, O31, M10, O32, L25

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#### 1. Introduction

In the modern world, characterized by rapid technological development and increasing competition, innovation has become not only a desirable element, but a vital factor for the successful operation of any industrial organization. In this sense, the strategy of sustainable development, the automation of production processes and obtaining the ISO 9001 international certification, become reliable solutions for increasing competitiveness and ensuring the long-term development of industrial organizations.

Innovation activity is a complex and multi-stage process that includes various scientific, financial, and technical aspects. It begins with the emergence of an idea and the first steps in its implementation and ends with the creation of a finished product that becomes a market leader. Innovating organizations strive to master new technologies, develop, and produce new products and services. They aim to maintain high development rates, reduce costs, and increase profits.

The essence of innovation is to find new ways to improve existing solutions and enhance their positive qualities. Their implementation makes it possible to increase production efficiency, improve product quality, reduce costs and, as a result, gain a competitive advantage. The concept of "innovation" in the context of this paper will mean an innovation introduced or being implemented that increases process efficiency and improves product quality, while being in demand in the market.

### 2. Literature Review

Innovation is crucial to the success of industrial organizations, and the literature offers valuable insights into this domain. Clayton M. Christensen (1997) introduces the concept of "disruptive innovation," explaining how new technologies can disrupt market leaders and the need for adaptation. Peter F. Drucker (1985) emphasizes the importance of integrating innovation into management practices, promoting an entrepreneurial mindset. Henry Chesbrough (2003) promotes "open innovation," suggesting external collaboration to drive innovation. Michael E. Porter (1985) explores the impact of innovation on competitive advantage, while Kim and Mauborgne (2005) propose "blue ocean" strategies to create new markets. James M. Utterback (1994) discusses how organizations can navigate technological change. Joseph Schumpeter (1942), in Capitalism, Socialism and Democracy, introduces the concept of "creative disruption," emphasizing the essential role of innovation in economic and industrial change. Additional sources, such as the Global Innovation Index 2023 report and studies by Agafonov (2010), Komarov (2012), Muller (2012), Parfenova and Yuklasova (2019), provide additional insights into challenges and solutions in innovative development. These sources contribute to a comprehensive understanding of how innovation can be effectively integrated and managed in industrial organizations (Minculete, 2021).

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### **3.** Innovation Management: Classification, Methodology and Effective Implementation

One of the first to talk about innovation was the Austrian and American economist Joseph Schumpeter (Schumpeter, 1942). He believed that innovation is primarily associated with new combinations of factors of production. These combinations can manifest in the form of new products, technologies, or markets (Komarov, 2012).

It is important to note that the process of development and implementation of innovations is not an end in itself and must be seamlessly integrated into the organization's management system (Hrab, 2023). It is necessary to create effective mechanisms that ensure the constant search, analysis, and implementation of new ideas, allowing the organization to adapt to changes in the external environment and stay ahead of competitors. In order for innovation to become a truly effective tool for managing an industrial organization, it is necessary to develop and implement a special methodology. This methodology should provide a systematic and structured approach to the innovation process, starting from the determination of the development strategy and ending with the evaluation of the results.

An important step in crafted an effective methodology for innovation management is the classification of innovations. There are many classifications of innovations that help to systematize their diversity. One of these classifications is the division of innovations according to the priorities of their appearance. Within this classification, innovations are divided into initial and subsequent innovations, as well as replacement, cancellation, return, opening and retro innovations. This classification makes it possible to evaluate innovations according to the degree of their influence on existing processes and products (Parfenova and, Yuklasova, 2019).

Separately, material, technical, and social innovations are worth highlighting. The former is used in industry and technology, and the latter in economics, law and social management. Depending on the reason for its appearance, two types of innovation can be distinguished: reactive and strategic. Reactive innovations occur in response to competitors' actions, while strategic innovations aim to achieve competitive advantages and play a key role in the long-term development of organizations. The classification of innovations can be based on the expected outcome of the market response. In this case, we can talk about local, comprehensive, and political principles. Innovations can also be classified by degree of future potential, highlighting cardinal, configuration, and enhancement innovations (Sisu et al, 2024). Radical innovations make fundamental changes in technologies or markets, and advanced products are improved versions of existing solutions (Zlati, 2023). Radical innovations are often associated with fundamentally new approaches and technologies, while advanced products improve and update their existing features (Muller, 2012).

By the nature of the application, innovations are divided into: product, process and social. Product innovation aims to create new or improved products,

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process innovation aims to change production technologies and operational processes, and social innovation aims to influence social practices, management, and organizational structures. Finally, depending on the magnitude of the impact, innovations can be divided into unique innovations, which are implemented on a limited scale, and diffuse innovations, which spread and influence entire industries and economies.

Various types of innovations (technological, product, procedural, marketing, etc.) require a special approach to their development and implementation. Therefore, the methodology should provide tools for determining priority areas for the development of innovations and their subsequent implementation.

#### 4. The Role and Factors of Innovation in Industrial Production

In industrial production, innovation plays a key role in enhancing productivity, improving product quality, and increasing the economic efficiency of organizations. The use of modern technological solutions, such as the Internet of Things, makes it possible to optimize the monitoring and control of production processes. These technologies provide the ability to track energy and resource costs and improve product quality. They provide the collection and analysis of large volumes of data, which help in making informed management decisions and optimizing business processes.

According to the Global Innovation Index, countries that actively invest in innovation demonstrate resilience and the ability to quickly recover from global economic shocks such as the COVID-19 pandemic. This confirms that innovation is necessary not only for boosting the competitiveness of the national economy, but also for its sustainable development (Global Innovation Index 2023).

Let's consider the factors that contribute to the development of innovationoriented industrial organizations. Let's divide them into categories and highlight the main characteristics of each of them (Agafonov, 2010):

1. Economic conditions: - availability of financing through risk funds, government grants, - private investments, - investment and financial block, which includes budgetary and risk funds that provide resources for innovation and the development of new technologies.

2. Legal regulations: - legislation regulating innovation activities (protection of intellectual property, environmental safety standards, quality standards and licensing requirements).

3. Technological development: - the availability and development of modern technologies, such as robotics, automation, and artificial intelligence, for integration into production processes.

4. Market environment: - competitive pressures and market needs that stimulate innovation as a way of differentiating from competitors.

5. Human capital: - the presence of qualified and talented specialists capable of conducting research and development, as well as managing innovative complex projects.

6. Infrastructure: - innovation centers, technology parks and business incubators that provide support and resources for the development of innovative organizations.



Figure 1. Factors Contributing to the Development of Innovation-Oriented Industrial Organizations Source: drafted by the author based on information (Agafonov, 2010).

Internal factors, in turn, can be divided into four groups:

1. Technological base. It is the availability of modern equipment and infrastructure facilitates the implementation of new technologies.

2. Management practices. This includes the qualifications and skills of managers, their ability to use innovative management methods. A clear development strategy is also important, including planning and organizing innovation activities.

3. Corporate culture. This is the degree to which an organization is open to change and innovation. It is important that employees are engaged with innovation and actively participate in improving processes and products.

4. Financial resources. If an organization has access to internal resources to invest in research and development, it can manage its innovation processes independently. This allows us to minimize our dependence on external investors and credit institutions.



#### Figure 2. Internal Factors Contributing to the Development of Innovation-Oriented Industrial Organizations

Source: drafted by the author based on information (Chesbrough, 2003).

Also, an important component of an effective innovation management methodology is the consideration of external and internal factors that influence the innovation process. Economic conditions, legal regulations, technological development, market environment, human capital, infrastructure, technological base, management practices, corporate culture, and financial resources - all these aspects must be taken into account when developing a methodology.

One of the primary innovative development models is the linear model. It involves a consistent transition from scientific research to technology development and finally to their commercialization. An example is the creation of new products in the pharmaceutical industry, where research and development are clearly structured and follow predefined steps.

On the other hand, the network model emphasizes various actors in the innovation process, such as universities, research institutes, companies, and government agencies. This model emphasizes collaboration and knowledge sharing between parties. An example is Silicon Valley in the United States, where hightech companies and research centers facilitate the rapid implementation of new technologies.

There is also an open model that involves the involvement of consumers and other external participants in the process of creating new products and services. This allows companies to capitalize on external ideas and innovations and collaboratively develop new technologies.

These innovative development models, such as linear, network, open and others, can also be included in the innovation management methodology. The choice of a suitable model depends on the characteristics of the organization and its strategic objectives.

# 5. Strategies and Challenges in the Integration of Innovations in Industrial Organizations

From the perspective of industrial organizations, there are strategies that help the adaptation of stakeholders, for example, one factor for the successful integration of innovations is to ensure that employees are fully informed about innovations and provide training to master new methods and technologies. to eliminate resistance to change, enhances employees' understanding of the goals and benefits of innovations among employees (Utterback, 1994).

Moreover, the involvement of employees in the process of development and implementation of changes not only increases their motivation, but also helps them to quickly adapt to new conditions. Indeed, during times of change, support and feedback from management is very important for staff. This allows to minimize problems that may arise during the transition period.

Another strategy is to motivate employees through reward systems for implementing and using innovations. Control mechanisms can also be established to monitor progress and evaluate the effectiveness of innovations. This will help

maintain interest in new approaches and allow the process to be adjusted based on the results obtained.

Finally, companies can tailor innovations to market needs based on customer feedback and market data analysis. To do this, a system can be created to collect information about consumer preferences.

Examples of successful strategies and practices for introducing innovation in industrial sectors in different countries can also be used as a basis for developing your own methodology. Speaking about the practices of introducing innovations in industrial organizations around the world, it is worth highlighting Germany. The country is a leader in the industrial sector due to its strategic approach to innovation. Germany's successes are particularly visible in areas such as chemical production, mechanical engineering and automobile production. This is facilitated by funding and a clear focus on product inventions.

Known for its automotive and electronics innovation, Japan demonstrates how resource scarcity can spur the development of innovative technologies. The country successfully replaces imported products and creates new ones, which contributes to the development of the industry (*Ooi*, 2025).

In the United States, the diversity of industrial development allows regions to specialize in different types of production. Industries such as mechanical and aerospace engineering are actively developing there.

State policies supporting innovation also plays an important role in the innovative development of industrial organizations. Increasing innovation activity, improving legal and fiscal regulation, providing institutional support - all these are important aspects that should also be taken into account when developing innovation management methods.



Figure 3. Common Trends in Government Policies to Support Innovation in Industrial Organizations

Source: drafted by the author based on information (Drucker, 1985).

Government policies to support innovation in industrial organizations have common trends in different countries of the world. Some of these trends include:

1. Financial support and incentives for innovation: Many countries offer government subsidies, grants, tax breaks and other forms of financial support for innovation projects. For example, the United States has the Small Business Innovation Research (SBIR) program, which provides government grants for the development and commercialization of new technologies.

2. Development of human capital: Many countries focus on the education and training of qualified personnel in the field of innovation. For example, Japan actively promotes scientific research and high-tech industries by developing university programs and educational research institutes.

3. Technological modernization and energy efficiency: Many countries are promoting technological modernization in industry to improve energy efficiency and reduce environmental impact. For example, Germany is actively developing innovative projects in the field of energy saving and green technologies.

4. Support for start-ups and small organizations: many countries create special programs and incubators to support start-ups and small business development. For example, Singapore's Enabling Ecosystem for Startups (ACE) program provides financial and infrastructure support to aspiring entrepreneurs.

5. Support for import substitution: In the context of globalization, many countries are focusing on reducing dependence on imports and developing local production. For example, in Brazil there are programs to support domestic production and import substitution in various industries.



Figure 4. Global Challenges in the Innovative Development of Industrial Organizations

Source: drafted by the author based on information (Christensen, 1997).

At the same time, the innovation-oriented development of industrial organizations faces problems and challenges around the world, among them:

1. Lack of funding: In the United States, a number of small and mediumsized organizations face problems accessing financial resources for innovative development. This issue is also relevant for many industrial organizations in the European Union, where lack of investment can slow down the pace of innovative development.

2. Lack of skilled workers: The lack of technical skills is becoming a serious problem in countries like India and China, where rapid economic development requires large numbers of highly skilled workers to support innovation.

3. Bureaucratic obstacles: In Eastern European countries, underdeveloped licensing systems and complex registration procedures can slow down the process of innovation in the industry.

4. Competing in the global market: In Germany, industrial organizations face the need to adapt and implement new technologies to remain competitive in the global market, especially in the automotive and engineering industries.

5. Technology convergence: Japan is seeing a convergence of traditional manufacturing industries with new digital developments. This requires adapting production processes and human resources to successfully implement new technologies. Thus, the problems and challenges associated with the innovative development of industrial organizations are indeed similar and can be observed in different countries, despite their differences in economic and political context.

To solve all these problems, it is necessary to reform the tax system. It is also important to strengthen the legal protection of innovation, increase government support for innovative projects and strengthen the institutional framework for innovation. If these recommendations will be applied, it will be possible to create a favorable environment for the sustainable innovative development of industrial organizations, regardless of the cultural and territorial characteristics of the region.

# 6. Successful Implementation of Innovations in Industrial Organizations

The author would like to emphasize that a top manager who introduces innovations to an industrial organization must have a certain set of qualities. First, he must be competent in his specialization. Secondly, he needs knowledge and skills in the field of personnel management, which include knowledge of psychology, ethics of interpersonal relations, as well as the ability to lead by example and inspire others. Finally, a top manager must be sociable, show his individuality and develop personal qualities that help him interact effectively with the team and achieve his goals.

Possessing all the above qualities, the manager can develop and apply a management methodology of an innovation-oriented organization. This

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methodology combines the management of different types of resources: manpower, logistics and finance. Its goal is to embed innovation in all aspects of an industrial organization, which includes new product development, process optimization, leveraging digital technologies and creating a culture of continuous improvement.

This methodology represents an integrated approach to managing innovation in an organization and includes several stages:

1. Analysis of the current state of the organization. At this stage, the innovative potential of the company is assessed, key weaknesses and opportunities for innovation are identified.

2. Elaboration of an innovative development strategy. Here the goals and objectives of the innovation activities are determined, the vision and mission of the innovation is formed, and the strategic directions and priorities are selected.

3. Elaboration of an innovative development strategy. In this stage, an innovation center or lab is formed, and the roles and responsibilities of employees related to innovation are determined.

4. Development of innovation processes. In this stage, the processes of ideation, prototyping and testing are defined, as well as knowledge management and staff training.

5. Introducing an innovative culture. It encourages openness, collaboration and creativity and encourages risk-taking and tolerance for failure.

6. Monitoring and evaluation of innovative activities. In this stage, key performance indicators (KPIs) are monitored, regular audits are carried out and innovation processes are adjusted.





The main elements of the methodology are:

1. Innovation audit - assessment of the current level of innovation activity of an organization and its innovation potential.

2. Innovation strategy - defining clear goals and objectives aimed at introducing innovations.

3. Organizational support – creating structures that facilitate the development of innovation, such as specialized units or innovation hubs.

4. Ideation and development processes - a systematic approach to the generation and implementation of new ideas.

5. Culture of innovation - creating an environment that supports experimentation and innovation.

6. Monitoring and feedback system - evaluation of results and adjustment of innovative projects and strategies.



Figure 6. The Key Elements of The Innovation Management Methodology Source: drafted by the author based on information (Porter, 1985)

#### 7. Conclusions

In other words, this methodology consists in the creative adaptive nature of work, in the versatility of knowledge, in the inclination for analytical thinking, in the ability to focus for certain periods of time on limited problems, in the ability to bring things to a logical conclusion. Thus, one of the prerequisites for its effective application in practice is knowledge of current trends in the industrial sector and the ability to manage various types of resources. Therefore, the methodology helps

organizations not only to respond to current changes in the business environment, but also to actively shape the future through innovation and strategic development.

Industrial companies striving for innovative development cannot succeed without the use of scientific advances and the development of new technologies. Today's challenges, such as the transition to new types of raw materials, the reduction of waste and carbon emissions, require an innovative and technological approach to solve them effectively. The introduction of innovative technologies can lead to significant improvements in production and increased environmental sustainability. And the main task of the top manager in this case will be to organize and conduct the entire difficult process. Consequently, the development and implementation of effective innovation management techniques is an integral part of the successful operation of industrial organizations in modern business conditions. This methodology should be adapted to the characteristics of a particular organization, take into account external and internal factors, apply modern innovative development models and be focused on achieving strategic goals and increasing the company's competitiveness.

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