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## MODERNIZATION AS A FACTOR OF INNOVATIVE DEVELOPMENT OF THE ENTERPRISE

### МОДЕРНІЗАЦІЯ ЯК ФАКТОР ІННОВАЦІЙНОГО РОЗВИТКУ ПІДПРИЄМСТВА

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*Гончар О.І., Свістунів О.С., Троцьковський Т.С. Модернізація як фактор інноваційного розвитку підприємства. Оглядова стаття.*

Узагальнено теоретичні основи модернізації підприємств, розглянуто ключові фактори, що визначають їх розвиток. Висвітлено характерні особливості, передумови та основні фактори технологічного оновлення інноваційно орієнтованих підприємств на системній основі. Обґрунтовано сучасні напрями розвитку обладнання та технологій, а також виділено важливу роль знань, інформації, процесів інформатизації для прискорення темпів технологічного оновлення та забезпечення сталого розвитку суспільства.

Теоретично доведено, що сучасні тенденції розвитку соціально-економічних систем, прагнення людства відновити духовні та культурні цінності підвищують важливість нових знань, інтелектуалізації економічних процесів та їх впровадження в техніку та техніку.

*Ключові слова:* технологічне оновлення, технологічний розвиток, системний підхід, орієнтовані на інновації підприємства, знання

*Gonchar O.I., Svistunov O.S., Trotskykovsky T.S. Modernization as a factor of innovative development of the enterprise. Review article.*

The theoretical bases of modernization of the enterprises are generalized, the key factors determining their development are considered. The characteristic features, prerequisites and main factors of technological renewal of innovation-oriented enterprises on a systemic basis are highlighted. The current directions of development of equipment and technologies are substantiated, and also the important role of knowledge, information, processes of informatization for acceleration of rates of technological updating and maintenance of sustainable development of a society is allocated.

It is theoretically proved that modern trends in socio-economic systems, the desire of mankind to restore spiritual and cultural values increase the importance of new knowledge, intellectualization of economic processes and their implementation in engineering and technology.

*Keywords:* technological renewal, technological development, system approach, innovation-oriented enterprises, knowledge

The fundamental provisions of modern concepts of nature management, resource provision and technological development were formed in the process of formation of various stages of civilization and socio-economic relations and were based on the principles of capitalization, profit growth, increasing national wealth. Each historical period, which was characterized by certain achievements in the development of material and technical production, was reproduced in economic theories, the authors of which were supporters of social progress, scientists who substantiated from an economic standpoint both the advantages of the achieved level of development, their driving forces and problems. However, the current stage of development of socio-economic formations is characterized by the manifestation of the dominant position of the accelerated pace of technology development, which requires new research in this area.

#### Analysis of recent researches and publications

Many economic studies are aimed at defining common criteria for a clear understanding of the economy of the future and the role of new technological changes in economic processes, under the influence of which outline the most important guidelines and common principles. Selected aspects were studied by such domestic and foreign scientists as I.L. See [1], V.M. Geets [5], M.P. Voynarenko [3], M. Castells [4], I.M. Rassolov [7], L.I. Fedulova [10], O.S. Shnytko [12], J. Schumpeter [13] and others. However, the growing role of technological development in socio-economic processes requires further research to identify tools to enhance technological change in the areas of enterprise innovation in order to focus on sustainable development strategy.

*The aim of the article is to identify and systematize the key factors of intensification of technological renewal processes, disclosure and justification of the development of technologies of industrial enterprises on a systemic basis.*

### **The main part**

Today in economics are formed some features of the economy of the future – solidarity information economy, which determine the content of approaches in the formation of a new paradigm of technological renewal of industrial enterprises and the further development of its tools and concepts.

Many scientific papers devoted to the establishment of the information component of the future society, its fundamental nature, which combines information, technology and methods of processing and transformation of knowledge and the use of new technologies at different levels of the hierarchy of society [3]. In particular, I.L. See, I.M. Rassolov distinguish informativeness as a mandatory function of society, which is designed to teach, shape knowledge and create conditions for successful exchange, without temporal, spatial and political boundaries [1; 7].

M. Castells reveals the historical essence of information processes and emphasizes that information and information exchange have accompanied the development of civilization throughout human history and acquired a dominant position in all societies. The special conditions of the present time, which determine the dissemination of information and the extent of its use, according to the scientist, reveal the information age as an era of globalization. Scientists have identified a fundamentally important point - a new society that is emerging, is built in such a way that the collection, analysis and transmission of necessary information have become fundamental sources of productivity and power [4]. In his works, M. Castells argues that the dominance of information and knowledge, as well as changing the directions of their use, leads to the prevalence of global, network structures that change the former forms of personal and material dependence.

Attracts the attention of many scientists around the world, scientific work of a prominent American sociologist, the founder of the concept of post-industrial society D. Bell, which contains a statement of all its basic elements and a reasonable understanding of the processes occurring in the economy and social sphere [2]. An important feature of post-industrial society, according to the scientist, is the transition from the production of the maximum number of machines and things (industrialism) to the development of services related to education, health, research and management.

Thus, one of the main tasks of strategic development of industrial enterprises as full participants in global competition is their technological renewal based on the use of new knowledge, introduction of intelligent technologies, alternative energy technologies, automation, robotics and electromechanics, information technologies, etc. At the same time, transformational changes in economically developed countries confirm that in world practice there is a tendency to rapidly move from traditional market goals - the formation of material goods and income to ensure unlimited profit growth – to the need to create economic goods while preserving the natural potential of both regions and world society in general [10; 12].

However, in the conditions of international hypercompetition and the need to ensure economic security due to accelerated economic growth, the need for high-quality technology upgrades based on innovation, digitalization of the economy and expanding the scope of information systems and high-tech processes. As the change of technological systems generates many new economic processes that require theoretical research and forecasting, in this regard, new categories and concepts emerge that reveal the essence of technological renewal of the current stage of economic development in various forms. Methodological and conceptual approaches to ensuring the technological renewal of industrial enterprises are the subject of many discussions in the research literature. Attention is drawn to the problems of identifying key positions of technological renewal, substantiation of the role of the state in technological development, the relationship of technology and innovation, and others. This is evidenced by the evolution of innovation theory, which is part of the foundation of the methodology of technological renewal. It highlights the period of technical and economic paradigm of economic development, in which the factor of technology manifested itself in various models, concepts and scientific ideas.

A special concept, which considers the need to transfer state power into the hands of technical specialists (engineers, technicians, production organizers, and scientists), because they are able to make political decisions based on science and in the interests of society, is technocracy - installation on the method of technology management by means of the technology itself, which is applied in accordance with the level of development of society.

The authors' conclusion about the positions of technocracy is that technology plays an important role in socio-economic processes, as it ensures the implementation of management processes, and intelligent technology is an integral part of the management system and national security of each country.

It is an indisputable fact that the combination of trends in science, innovation and technology and institutional support for their development at the macro level is crucial for the technological renewal of micro-level entities.

Solving the key problems of active introduction of innovative technologies on a scientifically sound basis in various industries requires intensification of the processes of formation and development of the national innovation system. Each country develops its own concept of its creation, which, according to the study of L.

Shapovalova, is based on three main theories: the innovative theory of J. Schumpeter; D. North's innovative theory of institutional change; general theory of systems [11, p.94]. According to the general theory of systems, an innovation system should be understood as a set of institutional formations whose activities are aimed at reproducing knowledge, scientific information and innovation by consolidating science, education, business and the state on a mutually beneficial basis to increase economic potential of the country or region [8].

In the works of J. Schumpeter, the role of innovation and technology acquired a new theoretical content as a driving force in the development of socio-economic formations. He revealed the relationship between innovation and technological processes occurring in economic systems, considered the basic categories that reproduce this area of research [12].

The national innovation system is defined by the legislation of Ukraine as a set of legislative, structural and functional components (institutions) that are involved in the creation and application of scientific knowledge and technology and determine the legal, economic, organizational and social conditions for innovation process [6].

Thus, two main directions should be identified as characteristic of the modern period of formation of the solidarity information society in our country. The first direction should involve the choice of industries in which the most important priorities of scientific and technological development should be associated with large-scale breakthrough projects. The second direction should provide long-term work in the field of strengthening all parts of national innovation subsystems – in the economy, information, education and health, environmental protection, which together form a viable system of innovation [9].

However, it should be noted that with regard to the micro level, the vast majority of researchers recognize the methodology of a systematic approach to technological innovation and its acquisition in terms of accelerating scientific and technological progress of fundamental importance not only in theoretical but also in practical application. This is also confirmed by the practical aspects of this area of research, as technological updating is determined by the need to implement systemic measures for the use of developments in production and in all activities of the enterprise [12].

World scientific achievements in the study of technologies and the practice of their application in economically developed countries confirm the thesis that the sustainable development of industrial enterprises in various sectors of the economy is achieved through large-scale, continuous use of modern technologies. Accordingly, the objects of technological renewal include the result of scientific and technological progress – a new technological solution, new technology, new equipment. Their implementation should be scientifically sound, with predictable opportunities for successful adaptation to the requirements of the internal and external environment and compliance with the deadlines for implementation.

The results of theoretical research allow us to consider technological renewal as a system (Table 1).

Table 1. Logical representation of technological update as a system

Problematic aspects of the internal and external environment	Technological update tools	Transformation processes	Result
High degree of equipment wear	Equipment replacement, overhaul, restructuring	Introduction of new technologies, production of new products, growth of labor productivity	Environmental friendliness of production, innovation, fuller satisfaction of consumer demand, growth of profits
Low level of technological renewal potential	Introduction of the newest technics and technologies	Technical development of production, development of control systems	Rational, ecological production, technological innovations, profitability
Lack of highly qualified personnel	Advanced training of employees	Stimulation and search for ways of continuing education	Growth of human capital, intellectualization of production processes
Low level of investment and innovation policy	Development of technological update policy	Automation and mechanization of production and economic processes, computer technology	Rational, ecological production, technological innovations, profitability, intellectualization of production processes

Source: authors' own development

In particular, technological upgrades can be carried out on a daily basis at enterprises, and technological changes, covering all other levels, provide for the application of longer terms - more than one year or more. It should also be noted that the important factors of the slow pace of technological renewal of industrial enterprises include the lack of the necessary personnel, financial, investment and innovation, information, regulatory and legal support. Therefore, those enterprises in which technological renewal is organized on an innovative basis are considered to be innovation-oriented by right.

The most important directions of development of the national economy of Ukraine and its target strategic guidelines determine the transition of industrial enterprises to modern management models that combine subsystems that ensure their adaptation to changing market conditions. The need for such adaptation significantly affects the stable competitive position of enterprises and puts technological renewal as a priority tool for their significant economic growth. Management of technological renewal involves the selection and application of effective methods and tools that will ensure the sequence of work, the formation of appropriate organizational structures, in the format of which provides technological development of industrial

enterprises. Therefore, the purpose of the technological update management system is to form influences on the managed system in order to achieve the goals of technological development of production and other enterprise systems.

Technological renewal is the key to the successful operation of enterprises in various industries, which offer a number of opportunities to achieve effective development and adequate response to changes in the external and internal environment. In this regard, there is a constant need to form an effective methodology for assessing the quality and effectiveness of technological innovation in enterprises, given the complexity and multifaceted study of the outlined issues.

With the emergence of new risks and threats to the national industrial complex, need further study to ensure their technological renewal, which highlights the need to identify the most effective methods for assessing its quality and efficiency.

Today, in the face of uncertainty and instability of the national economy balancing economic activities of industrial enterprises, high quality services, technology and financial instruments as well as the ability to resist threats on the level of quality and efficiency technological renovation of an industrial enterprise, which is formed by a series of successive operations, characterized by the presence of about and subjects of its implementation. When deciding on technological upgrades, it is necessary to take into account changes in all technical and economic characteristics of the facility and upgrade in two stages with a comparison of quality and efficiency: the acquisition of new and subsequent use of old equipment; alternative upgrades.

One of the options for upgrading is to support the technological base: overhaul of equipment; technical re-equipment of the enterprise; replacement of used equipment with new ones; replacement of individual components and parts of equipment. The development of the technological base should include such options for technological renewal as: modernization; technical reequipment; reconstruction; expansion; new construction.

In order to determine the feasibility of technological renewal of the enterprise, it is necessary to assess all revenues and costs in the case of operation of old equipment and purchase of new ones. The essence of this method is to ensure the decision to replace the equipment used with new ones. From the possible options for purchasing new equipment, it is advisable to choose the best for a particular type of production.

The analysis of each of the alternative options for assessing the quality and effectiveness of technological renewal of the enterprise should be carried out at the stages of: preliminary analysis – allows you to estimate the profit from the choice of option renewal; market analysis – provides an assessment of demand and sales opportunities for products manufactured after the upgrade; technical analysis – identification of types of equipment or technology that are optimal for the purposes of the update, with the possibility of involving experts; financial and economic analysis – includes analysis of the main financial and economic indicators for the previous few years and the current financial condition of the enterprise, the forecast of costs and profits, assessment of the effectiveness of the update.

## Conclusions

Thus, based on the results of our research on the theory and practice of socio-economic development of Ukraine, it should be concluded that the development of the domestic economy is not carried out effectively, according to the chosen model of development, taking into account national characteristics. Structural restructuring of the national economy, which will ensure its sustainable growth and sustainable development in the near future, is possible only on a new intellectual, economic and organizational basis, based on high-tech type of reproduction. This requires the creation of preconditions for the formation and mobilization of internal reserves of sustainable economic development and, above all, the existing intellectual potential in the country, which is transformed into technological renewal.

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