CHAPTER 1
CURRENT TRENDS IN ECONOMIC DEVELOPMENT

ACTUAL DIRECTIONS OF REGULATION AND STIMULATION OF INNOVATIVE DEVELOPMENT OF INDUSTRIAL ENTERPRISES

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Abstract. *The article explores current directions of regulation and stimulation of innovative development of industrial enterprises with the introduction of new, revolutionary technologies consisting of three main key components: providing state support and stimulating scientific and technical activities; assistance in promoting newly created innovations in industrial production; formation and development of the ecosystem of Industry 4.0. The purpose of the article is to study the current directions of regulation and stimulation of innovative development of industrial enterprises. The main objectives are to study the directions of state support for the introduction of new technologies and the renewal of production capacities of enterprises; systematization and classification of these areas, research of conditions and technologies that will ensure the technological and economic development of enterprises and ensure the development of a new digital economy in the country and active social and economic development. In order to substantiate the actual directions of regulation and stimulation of innovative development of industrial enterprises, a logical, dialectical approach and methods of scientific knowledge were applied: observation, comparison, abstraction. The comprehensive, systematic introduction of these innovations is possible to transfer innovation activity in Ukraine to a new level of high-tech digital development and will ensure dynamic integration, industrial introduction of newly created innovations, strengthen the relationship between science, education and industrial production and build a new national ecosystem of "Industry 4.0" in Ukraine on its basis. The main priority areas of technological development are: the field of information and communication technologies; Engineering; aerospace; military industrial complex; complex engineering; creation of new materials; and the creation of technologies in the field of alternative energy. These sectors are important, their development will have a significant impact on the development of other areas and industries. An important task in the development of innovative technologies of scientific technological developments with the introduction of technologies is the formation and development of the domestic market of technological innovations, companies that create innovations, their offers on the market and companies, enterprises that are in demand for these implementations.*

Keywords: *innovation, industrial development, regulation and stimulation of innovative development, digital technologies.*

JEL Classification: E22; G18; L59; O32

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Introduction. In the context of the development of a new digital economy, the socio-economic state of the countries of the world today depends on the state of technical technological development of their enterprises. In the twentieth century, the basis for the formation of the country's economic development was resources, in the twenty-first century such a basis is intellectual potential and technology. The modern economy is determined by the global transformation of existing and the formation of industrial production and social systems of a new level of technical and technological

development, based on the mass introduction of digital technologies and the Internet as the main technological basis for the creation and introduction of new technologies in industry. This is not only the introduction of new equipment or technologies by individual enterprises by innovators. Together with the prospects for rapid dynamic industrial development and digitalization of economic and social life, there will be a transition to a new level of development of economic and social systems. The processes of technological development taking place in the world actualize the need to restore and develop national production, national industry on the basis of modern digital technologies. Implementation of the best world experience, subject to the formation and implementation of a strategic state policy aimed at the development of industry, energy using the most revolutionary technologies will give Ukraine the opportunity to become one of the world's active manufacturers of both high-tech products in the production of equipment, instrument making, aircraft manufacturing, and in the production of chemical, metallurgical, food and light industries. The main resource and direction of development is to preserve the potential and ensure the creation and implementation of new developments and technologies created by domestic developers, scientists, specialists and stimulate demand for industrial innovation, developments created by domestic enterprises and products of domestic production.

Literature Review. The issues of innovation, innovative development, determination of current directions of regulation and stimulation of innovative development of industrial enterprises were studied in the works of many scientists.

Thus, Drucker P. [1, pp.170-173], considered innovation as a tool or a means of achieving significant competitive advantages under the conditions of systematic introduction of innovation, changes and improvement of goods and technologies. Skull A. [2, p.154] considered innovation as the final product or technological solution, the end result of innovation in the form of a finished product, technology or service.

According to the research of Chukhrai N. [3, p.12], innovations are the use of new ideas and their implementation in goods, services, processes, in the management systems of the organization.

According to the research of Chukhrai N. [3, p.12], innovations are the use of new ideas and their implementation in goods, services, processes, in the management systems of the organization. Peltek L. [4], evaluated innovative changes, the use of technology or technology in the processes of organization of production and management, which lead to changes in production.

Bazhal Yu. [5] drew attention to the change in production technologies, which is of outstanding historical importance and is necessary. Deineka L. [6]it is noted that innovative development is a complex process that includes the development, creation, implementation and commercialization, dissemination of a new technical or other solution aimed at meeting certain needs.

Kindzersky Y.[7] focused on the innovation potential as a component of the industrial potential of the enterprise. Geyets V. [8] investigated innovation and innovation as a system that arose in the process of creating, implementing and implementing the results of scientific research.

Lapko O. [9], noted that innovations are aimed at improving technical, industrial, organizational and other relations in science, production, education and other areas of social activity. In the writings of Matyushchenko I. [10], the development and implementation of new innovative technologies in Ukraine in the context of a new digital industrial revolution was investigated.

Aims. The purpose of the article is to study the current directions of regulation and stimulation of innovative development of industrial enterprises.

The main objectives are to study the directions of state support for the introduction of new technologies and the renewal of production capacities of enterprises; systematization and classification of these areas, research of conditions and technologies that will ensure the technological and economic development of enterprises and ensure the development of a new digital economy in the country and active social and economic development.

Methods. In order to substantiate the actual directions of regulation and stimulation of innovative development of industrial enterprises, a logical, dialectical approach and methods of scientific knowledge were applied: observation, comparison, abstraction.

Results.. The development of domestic industry, its technical, technological renewal should occur with the introduction of the most new technologies. Such development requires innovative support – the availability and possibility at enterprises to use new modern digital technologies and investment and financial support for the processes of their implementation. State regulation of the processes of investment support for innovative development requires today updating the legislative framework for investment support for innovative development of industry, and the formation of mechanisms and tools of state regulation that will stimulate the demand for innovations, their implementation by industrial enterprises.

In Ukraine, there are more than 70 companies in 16 highly technological segments. Dynamic technological development and mass introduction of technologies in Ukraine is possible subject to the introduction of an updated industrial policy, in accordance with the vectors of development and innovative priorities. The country has the necessary resources for this. The most important resource is the intellectual resources of the country, the second necessary resource is the scientific base and developments of institutes, laboratories, design bureaus that carry out fundamental applied developments, the third is the existing new technologies created by domestic manufacturers that require their further implementation and commercialization, and the fourth is human resources – young specialists who study today studying modern information technologies and will be able to implement them. The country is provided with innovative resources only the question of their effective direction and use, because today they are little used.

For the development of investment resources, the country needs to create the necessary investment climate and state guarantee mechanisms that would activate, ensure participation in the investment process of domestic investors - society, the population as the main financial participants in the process of development of the country's industry and the development of a new economic system. The investment

resources that the state has are well-developed mechanisms of public private partnership that will ensure partnership and participation in the process of reviving the national economy of the state, business, society, and citizens of the country.

The first important direction in the development of scientific and technological developments is to provide state and public support for scientific technical activities in Ukraine with the introduction of fundamental, applied research and research, which will ensure the direct creation of a new level of scientific knowledge and innovation. A significant step in ensuring support for the development of scientific technical activities in Ukraine with the introduction of new technologies is the definition of strategic priority directions for scientific technological developments.

Actual directions of development of the sphere of scientific technological developments and introduction of new technologies are presented in Figure 1.

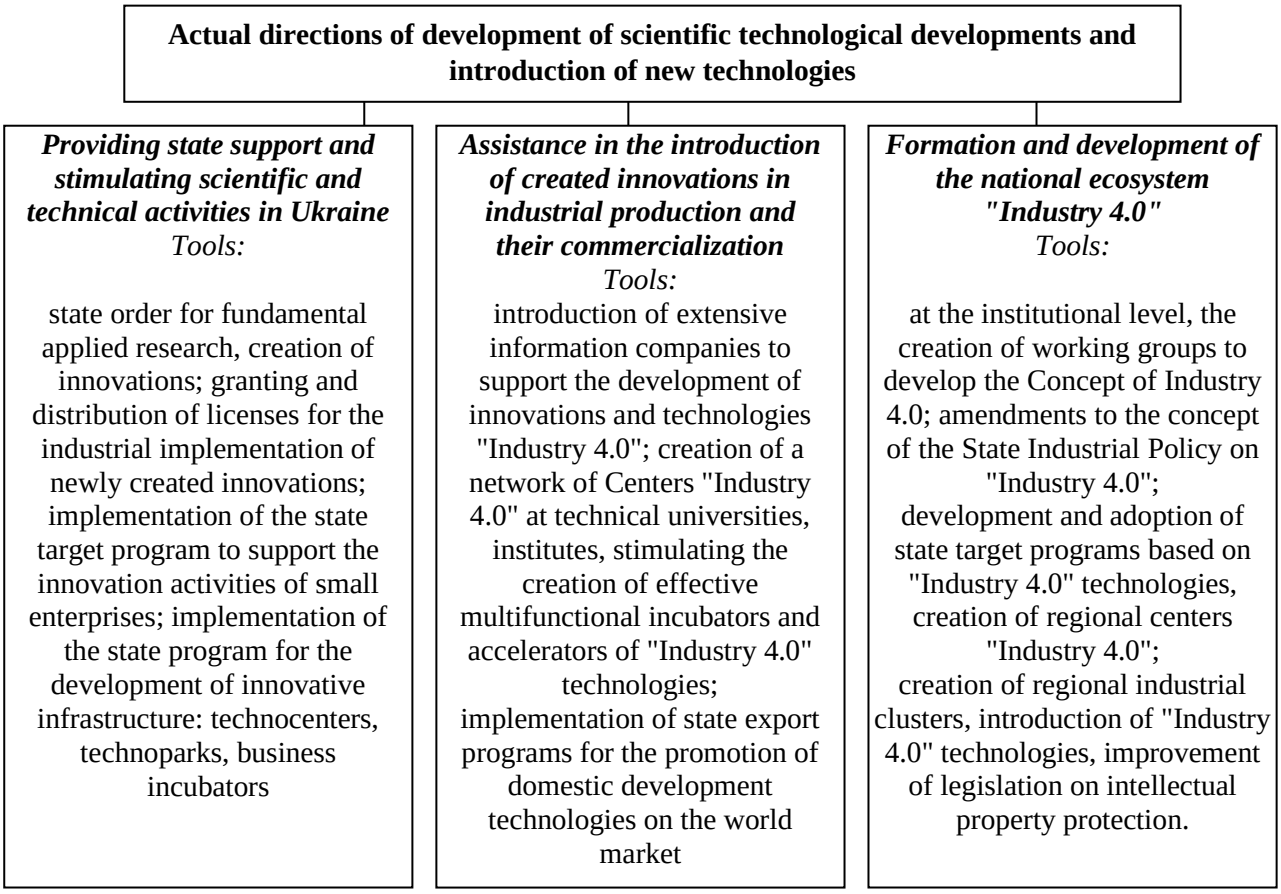

Figure 1. Actual directions of development of scientific technological developments and introduction of new technologies

Sources: formed by the author

The development of new technologies in the leading developed countries of the world is carried out within the framework of the implementation of state programs, while it is necessary and expedient to develop and implement a set of programs for the development of scientific research in the field of innovative technologies.

The state target program to support fundamental applied research is aimed at activating the conduct of fundamental, applied research and research works by

scientific and scientific research institutions of the country of all forms of ownership in the direction of creating and developing new scientific knowledge, technologies, new methods, 3D printing technologies, development of cyberphysical systems, introduction of production technologies, biotechnologies, nanotechnologies, alternative energy technologies, robotics and other technologies. The implementation of this program and financial, resource support can be carried out through the placement of state orders for the development of innovations in each of the areas of scientific technical research.

The state target program to support the innovation activities of small and medium-sized businesses is aimed at developing the activities of small and medium-sized businesses in the field of creating and integrating new innovative technologies. Today, in the leading countries of the world, programs for attracting small and medium-sized businesses to innovative activities are effective.

The implementation of the state target program for the development of innovative infrastructure will ensure the development of innovation infrastructure in the country, the opening and development of technical centers, technoparks, business incubators, and other structures necessary for the functioning of the innovation sphere and the subsequent effective introduction of innovations. The introduction of Industry 4.0 technologies in industry requires the availability and installation of appropriate equipment at enterprises, the establishment of accounting with the preservation and transmission of data in digital format and the availability of appropriate network infrastructure. This level of necessary automation is present only in part of domestic enterprises.

Technologies of "artificial intelligence" require the formation of a new level of automation of production, so the question of ensuring the "digital leap" is being raised and actualized, which will make it possible to overcome the "digital gap" in development technologies and sell production at a new digital level. This requires a significant change in equipment and production processes with the introduction of new digital technologies and significant investment resources. Promoting the promotion of newly created innovations in industrial production is the next important direction of the state industrial policy, since a significant part of the development remains developments and has no practical implementation.

One of the most promising and expected according to experts is the introduction of digital platforms and predicative analytics technology and technologies for rapid integration of production using appropriate devices and controllers. For example, in Germany in 2018, more than 400 digital platforms of the industrial Internet were already functioning.

The second area requiring industrial implementation is virtual, augmented and mixed reality technologies used in product design, inventory management, personnel training and maintenance.

The third direction is the technology of creating a virtual copy of a real object, which is able to predict the stop of equipment and improve quality. One of the most popular new technologies in the world has become the use of robotics, which has broad

prospects for industrial use in flow-transport and harvesting production and in other operations.

With the introduction of the industrial Internet, the ability and need to implement artificial intelligence technologies used to increase production productivity with increased data processing volumes will increase.

Technology is actively used and implemented, which makes it possible to optimize supply chains and production processes. One of the main obstacles to the industrial introduction of new technologies in Ukraine is the lack of awareness of domestic business about these technologies and the possibility and prospects for implementation. In the industrial introduction of innovative technologies, the presence and effective functioning of integrator companies that introduce new technologies developed by institutes, research organizations and technologies developed by leading international companies is important.

These companies integrate technological innovation into the production process of the enterprise using devices, software. Ecosystem development with the introduction of industrial high-tech technologies consists of several categories of participants: directly organizations of technology developers, developers of devices and devices; companies of system integrators of information technologies; integrators of automated control systems; manufacturers of new machinery, equipment; technological and engineering companies; end customers of industrial enterprises. Today, several powerful companies are market innovators in terms of demand formation, but the real functioning of the market with the involvement of a wide range of participants requires the formation of demand among a wide mass of domestic industrialists and entrepreneurs. To form such a market, it is necessary to inform specialists, the public and disseminate information about the benefits of introducing innovative technologies in the work of companies; state stimulation of introduction of new technologies and modernization of domestic enterprises; availability and access for domestic business and the scientific sphere to the financial investment resources necessary for the implementation of investment innovative projects and programs. The need to inform and advise business, industry, society and disseminate information on innovative technologies activates the creation of a network of Centers for Education and Promotion of Innovations at technical universities, institutes. Several such centers have already been established and are functioning in Ukraine. It is necessary to create a network of centers whose activities will be interrelated and aimed at achieving common goals.

Information educational and educational work of these centers will contribute to the introduction of new ideas, and will ensure the dissemination of innovative technologies by domestic developers. It will provide information on suppliers of new technologies – global companies and will provide familiarization with new projects and ideas that require investment. Such centers can ensure the maximum dissemination of ideas in the educational, scientific sphere, educational and scientific institutions, in the market environment of industrialists and entrepreneurs in the region.

This will make it possible to take the first steps in the creation and functioning of future regional innovative industrial clusters. The task of the centers should be to

popularize ideas among young people, students and acquire the necessary knowledge, information, experience in creating and implementing modern technologies. The next step in supporting scientific technical activities is the creation of effective multifunctional incubators and accelerators of innovative technologies that will ensure the development and promotion of domestic projects with the involvement of domestic and international investors, international organizations. The creation and operation of incubators and accelerators of industrial high-tech technologies will make it possible to promote revolutionary projects more widely and develop domestic companies in the field of industrial technologies. An important direction is the implementation of export programs to promote the export of domestic technologies, developments on the world market. The export potential of domestic innovative developments, the entry of manufacturers and developers into foreign economic markets and the export of technologies is one of the leading important strategic tasks.

Innovative development in Ukraine has its own characteristics from other countries of the world, its uniqueness and provides the country with opportunities for significant technological development. Ukraine has the potential to focus on innovations in services, the creation and implementation of complex unique technologies that improve, change services and production processes.

Discussions. The development of scientific technical developments and the introduction of technologies of "Industry 4.0" requires the formation and development of the national ecosystem of "Industry 4.0" the priority on the way of its creation is to conduct a full independent audit of the state of the main elements of the existing system of scientific and technological sphere. This will make it possible to determine the existing positions, developments and personnel and technological potential, to identify potential participants who will enter the new established ecosystem of industrial high-tech technologies. The next step is to establish technology transfer from domestic developers to their end customers both in the development of domestic industry and in the direction of export of high-tech technologies.

It is necessary to audit the existing infrastructure, determine its place in the new architecture of the Ecosystem "Industry 4.0" and form new elements that are currently missing. Thus, it is critically necessary to open Centers for expertise, laboratories, incubators and accelerators of Industry 4.0. The next necessary step is to create conditions for the development of investment activity and attract investments that will provide financing for the future ecosystem.

An integral part of the ecosystem of "Industry 4.0" is the provision of training of strategic specialists for the ecosystem of engineers and technologists. A significant increase in the volume of training of these specialists in four, five years will make it possible to activate the work of the entire system and stimulate its transition to a new, more active level of development. It is important to improve the skills of specialists working in the industrial sphere, to obtain new necessary knowledge.

An important integral element that can significantly strengthen the newly created ecosystem and contribute to the financial and staffing and activation of the transition to a new level of development is the activities of informal institutions, public organizations, associations in the field of national economy development and

interaction of state and non-state institutions, on the formation and dissemination of the Movement "Industry 4.0"; and building the digital economy and digital society. Formation of the national ecosystem "Industry 4.0". requires the adoption of an institutional regulatory legal framework and the development of institutions that will plan, organize, control and ensure the formation of a new ecosystem.

The creation and implementation of an ecosystem will require a number of planned actions. In the institutional spectrum, it is necessary to initiate the creation of working groups, to develop and adopt the Concept and Strategy of Industry 4.0, as well as to amend the concept of state industrial policy regarding Industry 4.0. It is necessary to develop and adopt state target programs for the development of industry on the basis of "Industry 4.0" technologies. The next step should be the creation and organization of the work of regional centers of industry 4.0 cells and the initiation of the creation and development of regional innovative industrial clusters that at the regional level will be able to interact with the parties in the industrial implementation of Industry 4.0 technologies.

Conclusion. Summarizing the research, we note that the current directions of regulation and stimulation of innovative development of industrial enterprises consist of three main components: providing state support and stimulating scientific technical activity; assistance in promoting newly created innovations in industrial production; formation and development of the ecosystem of "Industry 4.0" in Ukraine.

Systematic implementation of measures and tools of state regulation in these areas will make it possible to raise innovation activities in the country to a new level of high-tech digital development, ensure the integration and industrial implementation of newly created innovations, strengthen the relationship between science, education and industrial production and, on its basis, begin the development of the national ecosystem of "Industry 4.0" in Ukraine.

The creation of a new innovation ecosystem in the country is carried out with the creation of chains of interconnection and interaction of all elements of the system, the introduction of "Industry 4.0" in Ukraine and the establishment of their interaction. The development of an innovation ecosystem involves changes in the field of education, with the formation of new skills and knowledge; changes in the management of the processes of introduction of information technologies, innovation management; introduction of information technological network infrastructure, data storage, technical equipment of workplaces, basic and special software; development of infrastructure of industrial high-tech technologies; promotion, presentation, presentation of the accumulated results of innovation. An important task in the development of innovative technologies of scientific technological developments with the introduction of technologies is the formation and development of the domestic market of technological innovations, companies that create innovations and companies in demand for these implementations.

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