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SOFTWARE ECONOMY AS A VECTOR OF MANAGEMENT OF INNOVATIVE INFRASTRUCTURE OF THE REGION

The article presents the results of research on issues related to the soft economy's as a vector for managing the region's innovative infrastructure. The author defines the essence of the economic category "innovative infrastructure" as a dynamic self-regulatory system of markets and entities entering into these markets in certain economic relations within the limits stipulated by the legal acts of Ukraine and providing the necessary conditions for expanding the production of innovative products and technologies, services. The legal base of regulation of innovative infrastructure of the region in Ukraine is investigated. The estimation of the economic policy of the state from the point of view of conformity to the basic vectors of the modern economy is carried out. The article emphasizes the importance of soft and servicing processes in the context of modernization and formation on this basis in Ukraine, modern economies. It is noted that the rate on the economy as soft direction management is urgently needed development of the economic system in transitive economy type. There is an urgent need to intensify commercial activities in the provision of service and mutually beneficial relations between the entities of the innovative infrastructure of the region and business. The model of functioning of the innovative infrastructure as a complex of interconnected elements providing the soft and service of innovative processes in the modern economy is developed. Argued the relationship of the main subjects that should operate as a part of the innovation infrastructure in the region. It is emphasized that the characteristic features of the economy of modern society is the increasing role of intangible resources in ensuring social reproduction, "soft" and "servicing" of subjects of innovative infrastructure. The issue of increasing the value of intellectual and innovative components of a region's infrastructure in comparison with its material resources and financial capital is raised.

Key words: software, service, innovation, infrastructure, management.

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СОФТИЗАЦІЯ ЕКОНОМІКИ ЯК ВЕКТОР УПРАВЛІННЯ ІННОВАЦІЙНОЮ ІНФРАСТРУКТУРОЮ РЕГІОНУ

В статті представлені результати досліджень питань, пов'язаних з софтизацією економіки як вектора управління інноваційною інфраструктурою регіону. Запропоновано авторське визначення сутності економічної категорії "інноваційна інфраструктура" як динамічної саморегулюючої системи ринків та суб'єктів, що вступають на цих ринках у певні економічні відносини у межах, обумовлених нормативно-правовими актами України і забезпечують створення необхідних умов для розширення виробництва інноваційної продукції, технологій, послуг. Досліджено правову базу регулювання інноваційної інфраструктури регіону в Україні. Проведено оцінку економічної політики держави з позицій відповідності базисним векторам сучасної економіки. В статті підкреслюється значення процесів софтизації та сервізації в контексті модернізації і формування на цій основі в Україні економіки сучасного типу. Наголошується, що курс на софтизацію економіки як напрям управління є нагальною потребою розвитку економічної системи в умовах економіки транзитивного типу. Обґрунтовано гостру необхідність в активізації комерційної діяльності в наданні послуг з сервізації та взаємовигідних відносин між суб'єктами інноваційної інфраструктури регіону та бізнесу. Розроблено модель функціонування інноваційної інфраструктури як комплексу взаємопов'язаних елементів, що забезпечують софтизацію та сервізацію інноваційних процесів в сучасній економіці. Аргументовано взаємозв'язок основних суб'єктів, що мають діяти у складі інноваційної інфраструктури регіону. Наголошено на тому, що характерними рисами економіки сучасного суспільства є зростання ролі нематеріальних ресурсів у забезпеченні суспільного відтворення, «софтизація" і "сервізація" суб'єктів інноваційної інфраструктури. Піднімається питання про зростання цінності інтелектуальних та інноваційних складових інфраструктури регіону порівняно з його матеріальними ресурсами та фінансовим капіталом.

Ключові слова: софтизація, сервізація, інноваційна інфраструктура, управління.

Formulation of the problem. Software economy is a strategic driver of economic growth. The level of infrastructure development influences the country's development ratings. Costs for innovative infrastructure have a multiplier effect on the economy, as they affect most human endeavours in various spheres of life, such as manufacturing, construction, technology, purchasing, and more. The evolutionary development of the productive forces of modern society is the result of the constant development of fundamental and applied science and the spread of its influence on the improvement of technology, technology, organization of innovative production, increase of its efficiency. In the economy of modern society, production priorities move from the overwhelming desire to manufacture goods and products to the widespread provision of high-tech services, information and knowledge become the dominant productive resource. There is a tendency to increase the use of intangible resources in production processes, qualitative and quantitative growth of indicators of functioning of non-productive sphere, which specializes in providing various services related to the promotion and assistance of innovative entrepreneurship.

Accordingly, the study of the management system on the processes of the use of intellectual resources in the innovation sphere, in general, and in the activity of economic entities, in particular, in the conditions of a transitive economy is relevant.

Analysis of research and publications and selection of outstanding parts. Priority in the development of the world economy, since the second half of the twentieth century, is the widespread introduction of innovation in all spheres of production. The activity of the innovative system of the country in the introduction of the latest scientific and technological developments into production is the main factor of increasing the competitiveness of its goods in the world market. The formation of an innovation system includes a set of special tools and appropriate tools, which include regulatory acts and appropriate infrastructural support for innovation activities.

Intellectual work in the processes associated with the introduction of the latest scientific ideas, innovative proposals, start-ups is of particular importance and value. For the implementation of innovative projects, scientific ideas, business entities need to have highly qualified specialists, or seek advice from professional consultants, specialists in various fields of economics, technology and technology, who offer their services, acting individually or collectively, as sub innovative infrastructure of the country, region, etc. The division of intellectual labour along the path of "scientific idea - new production" creates the need to attract highly specialized specialists who can form certain associations and as actors to act within the innovative infrastructure of the country.

It should be noted that the Ukrainian legislator defines innovative infrastructure as a set of enterprises, organizations, institutions, their associations, associations of any form of ownership, providing services for providing innovative activities (financial, consulting, marketing, information and communication, legal, educational, etc.) [3].

Innovative production is a special form of production activity where the central killer practices the practical application of new knowledge and makes scientific and technical proposals. These intangible resources allow us to use other innovative products when used in manufacturing products, businesses, services and technologies. New knowledge used in manufacturing allows us to produce industrial products, modern scientific products and gain certain advantages over competitors. In a global economy, these benefits increase the competitiveness of a national organization in international markets, and intangible resources, such as new research and technology offerings, provide a major source and key driver for business development. Thus, in today's society, it is necessary to force all factors to make an increasingly substantial attack that has shown significant results and has certainly used an intangible resource. Value, as intangible resources, in the sophisticated, using the alternatives, starting to produce such products, is the source and the driving force behind a strong innovation economy.

We also believe that the innovation infrastructure is conditionally divided into "soft", "half-software" and "hard". "Soft" infrastructure involves the activities of its subjects related to the provision of information services, consulting, financial and insurance support, the acquisition of intellectual property. Half-software is about providing customers with the technology, equipment and gadgets they need to innovate. Hard infrastructure includes proposals for the use of engineering communications, structures, workplaces, buildings, etc.

Fundamentally new features of development are characteristic of modern society: first, it is an objectively conditioned phenomenon of softening; second, the transition to a service model of the economy. The processes of changes in the structure of the resource provision of economic development in the direction of increasing its intangible component are defined by the concept of "softization". Softization (from the English. Soft) – the process of transformation of intangible resources (services, intellectual potential of the enterprise, industry, economy of the country, society, individual) into an important factor of economic development [1].

Such traits and areas of economic development relate, first of all, to the innovation infrastructure as a sphere of implementation of high-tech services. Sophistication of innovation infrastructure can be defined as a process that ensures the formation and development of an innovative economy based on knowledge, the use of knowledge, ie intangible resources, as an important factor necessary for "materialization", the production of innovative high-tech, competitive products. Softization is considered to be a broader concept that includes as a major component the processes of service.

The purpose of the article is to show that economic development is a complex and multifactorial phenomenon, and softization is one of the most effective factors of modern economic development, promotes the emergence of innovative guidelines and motives in the activity of entrepreneurs, forms new value attitudes in economic activity. As a process of enhancing the role and value of knowledge, the effect of softening is manifested in the provision of information necessary for management decisions, development of energy, resource-saving, information and communication technologies, as well as in innovation, where new scientific proposals and know-how are identified as the main intangible factors necessary to ensure the production of new goods, products, services.

Presenting main material. Intellectual potential, knowledge and skills of scientists, researchers, inventors, entrepreneurs ensure the formation and efficient functioning of the country's innovation infrastructure. The sophistication of the modern economy implies an increase in productivity through the increasing use in the production of intangible resources, which, in addition to material, can provide innovative activity of enterprises. The main purpose of the entities of innovation infrastructure is precisely to ensure full scale processes of softening, providing a wide range of intangible services to enterprises and organizations that implement innovations, implement innovative projects. Softization is a direct result of the impact of scientific and technological progress on the structure of resource support for innovative development.

In a knowledge-based economy, the most important component of software is servicing (service, service) - the process of transferring intangible resources (dissemination of services) created by scientists, researchers,

inventors for their practical use in innovation. Such features and directions of development of innovative economy concern, first of all, its infrastructure as sphere of providing with intangible resources of processes of realization of innovative projects through service, provision of high-tech services. The phenomenon of softisation is manifested in the activities of the entities of the innovation infrastructure by disseminating service offers at all stages of the innovation process. However, the coverage of information and communication technologies in all spheres of society, and especially the economy, is increasing; the number of users using Internet technologies is also increasing, which entails increasing requirements for employees and incorporating the latter into the information space. This creates a vicious circle: social inequality generates information inequality, and information inequality entails a new social divide. In other words, this is what D. Bell referred to as "inequality of opportunity" or "inequality of results" [6], which provides a great deal of space for the application of elements of social infrastructure.

We propose a model of interaction of softening and servicing processes in the chain "science - innovative infrastructure - innovative production" and their role in providing enterprises with intangible resources, which is presented in Fig. 1.

In today's world, there is a growth and significant impact of those industries that are engaged in the production of goods and services. Services are the object of purchase and sale in modern society, the main productive resource is information and knowledge. Knowledge ceases to be a relatively independent object of economic development, which is usually limited to R&D. Today, knowledge penetrates all spheres and stages of the economic process and is too difficult to separate from a product or service [2].

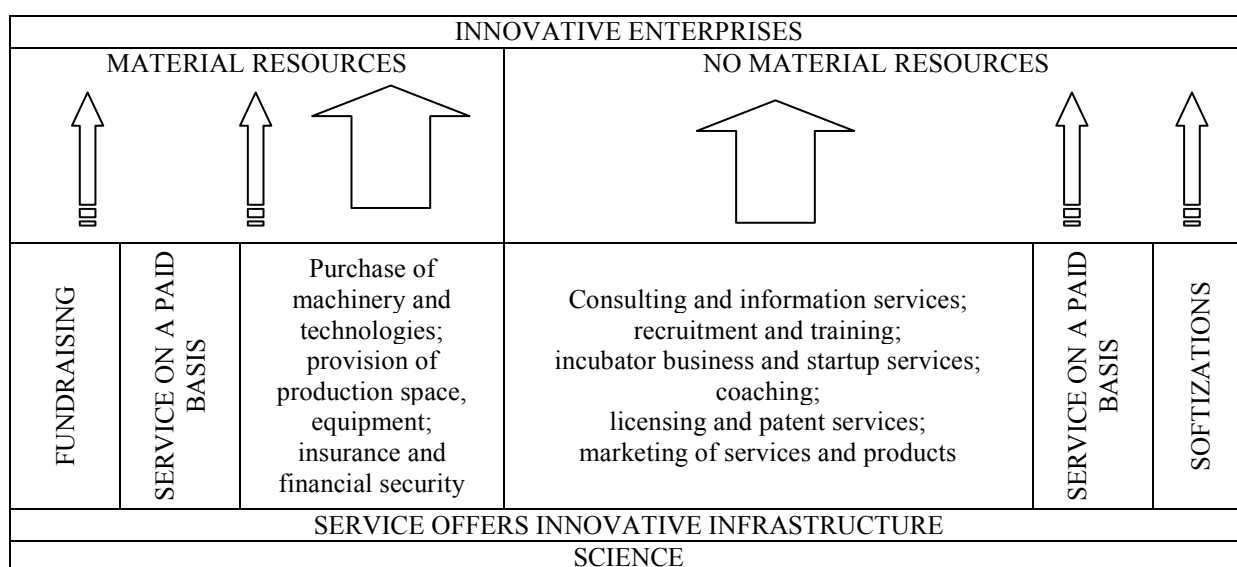


Fig. 1. Model of interaction of softening and service processes *

* Source: Developed by the author

Today we are talking about a new industrial era, also known as Industry 3.0. It is based on three principles:

1) The shift of the profit center from production stages to development and design centers. A classic example is the uneven formation of value added in the chains of design - creation and marketing - assembly.

2) Increase in labour productivity and, as a consequence, reduction of blue collar workers who are directly engaged in production.

3) Substitutions over the last centuries have become traditional centralized business models with distributed structures and horizontal interaction.

The infrastructure of the industrial society is transformed into the infrastructure of the knowledge economy through the inclusive distribution of softening and servicing processes in it. In modern society, the content and range of services provided by the entities of innovative infrastructure is greatly enhanced, more attention is paid to ensuring the efficiency of providing high-tech services, innovative service [5].

However, at a time when not all countries have adjusted their preferences to the above version, a new "revolutionary situation" is ripe – the German concept of Industry 4.0. Depending on its implementation, the very fact of the existence of the future industry of Germany was set against the background of the global transfer of production to Asia and other developing countries. The key engine of Industry 4.0 is the enhanced integration of cyber-physical systems, or CPS, into factory processes. Production facilities will interact with manufactured products and adapt as needed to meet new consumer needs. In this case, the entire stages of production will occur without human involvement. It is the production part of the Internet of Things that is rapidly penetrating our lives [4].

The subjects of innovative infrastructure specialize in providing services and form certain markets of services in carrying out innovative activity. Unlike soft-ware processes, the efficiency of servicing innovative

infrastructure is subject to measurement by analysing the volume of services used by innovatively active enterprises and their costs.

The difficult economic conditions in which domestic enterprises operate do not allow the necessary proportion to increase the costs of intangible resources, and, accordingly, to use them for innovative development. Thus, the share of enterprises engaged in innovative activity for the period from 2000 to 2020 remains practically unchanged and ranges from 10 to 20%. Costs of innovatively active enterprises, except for the purchase of machinery and equipment, are intangible. Expenditure on implementation of different areas of innovation has increased, although the structure of costs for research and development, obtaining external knowledge, preparing production for innovation, etc. almost unchanged. This "stabilization" of indicators of innovation activity of domestic enterprises indicates the lack of progress of further innovative development, fragmentation of the formation of innovative infrastructure of the country and the delay in the processes of softening and servicing the national economy [8].

The new economy, which is able to function successfully in the global environment only on the production and use of new knowledge, should become the Ukrainian system of strategic thinking and activity of the nation. We need to pay close attention to training in IT, engineering, industrial design. To set a task to create world-class scientific centers with a technopark equipped with the latest equipment. If we rely on the creation of state-of-the-art educational institutions in the field of industrial design based on the best Ukrainian engineering schools, then we have a chance to become one of the leading countries in the field of training of such specialists and in a few years time to bring Ukrainian software and engineering solutions to the world market.

Conclusions and prospects for further research. Thus, actors of innovation infrastructure play a key role in ensuring the processes of softening and servicing the economy. The phenomenon of softization is a characteristic phenomenon of post-industrial society, a direct result of the influence of NTP on the structure of the entire economy, including inter-sectoral links.

Refinement and servicing of the innovation infrastructure determine the increase in the role and place of intangible factors and services in the development of the national innovation system, and the related costs fall into the category of transactional. In order to understand the general patterns of formation of socio-economic mechanism of development of markets for innovative services operating within the innovative infrastructure of Ukraine, it is necessary to study the specifics of its service. Of great importance to the theory and methodology of servicing innovation infrastructure is its division into components into the intended purpose and value of services, without which the innovation processes occurring in the national innovation system will be impossible or ineffective. Due to the strengthening of the role of information, ITC and processes of software and service, the infrastructure of industrial society is transformed into the innovation and information infrastructure of the knowledge economy of post-industrial society.

Today, the mechanisms for economic evaluation of the use of intellectual and creative potential of enterprises, which is the most important economic resource of modern organizations, have not yet been fully worked out. This is especially true for Ukrainian high-tech enterprises, which in most cases possess significant intellectual and insignificant material and financial resources.

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