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Article

Institutional Structures Aiming to Increase Efficiency in The Regional Industrial Sectors and to Consistently Form A Competitive Environment in The Industrial Structure

PhD. Associate Professor Nabiev G'ulom Abdusalomovich

1. Independent Researcher, Department of Economics, Urgench State University

* Correspondence: -

Abstract: This article will highlight the relevance of the development of institutional structures in the development of the green economy and sustainable development in improving efficiency in regional industrial sectors, as well as in the formation of a competitive environment. The need to develop the industry on the basis of innovative technologies, digitized resources and digital management systems is justified. At the same time, the prospects for implementing institutional changes in the regions, improving the efficiency of rational use of industrial production resources and introducing digital economic mechanisms are analyzed. The article shows the importance of scientific research, innovative projects, science and educational integration in the activities of industrial enterprises and develops the institutional framework for the modernization of industrial structures based on high technologies – digital systems, nanotechnology, microchips and artificial intelligence. The result is scientific and practical conclusions on the sustainable development of the industry, ensuring regional competitiveness and improving economic efficiency. The process of economic capacity analysis is based on the fact that it serves to determine the possibilities and directions of development of industrial enterprises by processing, evaluating and interpreting indicators based on internal and external reports. At the same time, the role of the analytical support system in the assessment of economic potential, the interconnection of information and analytical methods in the decision-making process, the importance of Management in the effective organization is indicated. The study developed a conceptual model and mechanism for assessing the complex economic potential of industrial enterprises, in which a property object, a system of target indicators (EV, SV, EVA, NP, FCFF, E, A, N), as well as functional components are defined as key elements of potential. The assessment process emphasizes the need to take into account the interests of external and internal users, their goals and needs. The article also analyzes the profitable, cost-effective and comparable approaches to the assessment of economic potential, their advantages and limitations, as a result of which the need to formulate a comprehensive assessment of economic potential as a multicomponent system is based.

Keywords: green economy, sustainable development, industrial sector, institutional structures, digital management, innovative technologies, competitive environment, efficiency, Nanotechnology, Artificial Intelligence, regional industrial development.

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1. Introduction

It consists in implementing institutional changes in the development of industrial structures in the regions and improving the digital management of the industry, taking into account the prospects for the mass use of its digitized resources using innovative technologies. Issues such as the effectiveness of being able to use the resources of the production of industrial products occupy an important place. Economic development has reached a new level in the current era, creating a new system. This, in turn, determined

such tasks as the implementation of deep scientific research and innovative projects in the region. The main factor in its development as a result is scientific research work, science and education. In addition, the main aspect and effect of this system is high-tech, digital and nanotechnology, microchips, artificial intelect [1]. The emergence of industry as an independent branch of social production is associated with the separation of crafts from agriculture - the second major division of labor.he emergence of industry as an independent branch of social production is associated with the separation of crafts from agriculture - the second major division of labor. The capitalist industry appeared in western European countries in the 14th-15th centuries and went through the stages of ordinary capitalist cooperation, manufacturing and large machine industry - factories, the transition from manufacturing to machine industry in the late 18th-early 19th centuries took on an industrial turn in England at first, and later in other European countries. In Russia and some other countries, industry developed from the beginning of the XIII century in the form of a Manufactory, from the 2nd half of the XIX century the machine industry flourished.

Literature review. Representatives of modern institutionalism. American economist Elvin Toffler (1928-2016) created the theory of super-industrial society in the 70s and 80s of the 20th century with his works “conflict with the future” (1970), “the third wave” (1980) of literature on the topic [2][3]. Representatives of modern institutionalism. American economist Elvin Toffler (1928-2016) created the theory of super-industrial society in the 70s and 80s of the 20th century with his works “conflict with the future” (1970), “the third wave” (1980) [4]. In his work” the third wave “he analyzed the “waves” of the development of society: the first - agriculture, the second – industry, the third – scientific and technical revolution. In doing so, he states that the” third wave " moves from industrial society to a qualitative stage considered super-industrial, in which scientific and informational changes cause the reorganization of social life. Toffler believed that the developed nations of the West were at the first stage of super-industrial society. In the further development of scientific and technical and Information Development, the speed of life increases even more, that is, the relationship between them (due to the development of the internet) shrinks, changes in professions become commonplace, the life cycle of products shrinks, disposable goods increase, the service sector believes that leads [5]**.**

Scientific and technical progress, Toffler believes, will lead to the emergence of new global and social conflicts. In this, in his opinion, creative forces create changes in the life of society, and the level of economic development is replaced by a new one. Toffler believes that all changes in the life of a national farm will be planned and under state control.

The original form of institutional economics began with the emergence of the economic trend of institutionalism in the 40s-60s of the 20th century [6]. We can consider the participants in this direction separately. J.K. Galbraith in his works “The New Industrial Society” and D. Bell “Society after Industrial Society” described the initial manifestations of post-industrial society. In particular, according to J.K. Galbraith, the behavior of the modern market economy is determined by large corporations that produce complex equipment [7]. In his opinion, real economic power in modern corporations belongs not to the owners of capital and not even to managers, but to the owners of science, technology and technological knowledge. Representatives of the technostructure have specific professional knowledge of production and the information necessary for decision-making. Of course, officially important decisions, as a rule, are the exclusive prerogative of the company's leading managers - the director and his deputies. But all decision-making is almost 100 percent information-driven. And information is under the "control" of the technostructure.

Representatives of modern institutionalism. American economist Alvin Toffler (1928-2016) created the theory of a superindustrial society in the 70s and 80s of the 20th century with his works “Confrontation with the Future” (1970) and “The Third Wave” (1980) [8]. In “The Third Wave,” he analyzed the “waves” of social development: the first is agricultural, the second is industrial, and the third is the scientific and technological revolution. In it, he said that the “third wave” is a transition from an industrial society to

a qualitative stage called superindustrial, in which scientific and informational changes will cause a reorganization of social life. Toffler believed that the developed countries of the West are in the first stage of a superindustrial society. Scientific and technological progress, according to Toffler, leads to the emergence of new global and social conflicts. In this, in his opinion, creative forces bring about changes in the life of society and replace the level of economic development with a new one. Toffler believes that all changes in the life of the national economy are planned and under state control [9].

M.Y. Shlyakhtin, who described modern institutionalism, notes that the knowledge economy was formed in two stages. These are the periods of post-industrial and innovative post-industrial economy. According to the scientist, the use of modern technologies is one of the important drivers of the economic and social development of society, and at the same time allows creating an integration environment with other areas.

The assessment is made on the basis of the proposed systematization of theories and concepts. According to many factors, the influence of the state on the dynamics of scientific and technological development is of great importance.

The influence of state power on economic processes was noted by mercantilists, and in the late 16th and early 17th centuries, the region's industrial structure underwent systematic changes, which were linked to increasing the efficiency of the production process and digital information technologies.

During this period, supporters of the classical school (classical economics) formulated the ideas of economic liberalism, which included the proposal to minimize the influence of the state on economic processes [10]. They justified the effectiveness of market self-regulation through the mechanism of competition and proved the need for the state to refrain from interfering in economic life.

Classical economists actually recognized the need for such intervention, for example, in terms of taxation, see Table 1.

Table 1. A generalized classification of concepts, theories, and views on the management and development of scientific and technical processes.

Schools, doctrines, concepts, views	**Authors and followers**	**Views on innovation, scientific and technological progress, and the role of the state**
Mercantilism	A. de Montchretien T. Meyn, J. Lokk, J. B. Kolbert, I. Vellershteyn	Import restrictions, high prices for imported goods. Trade as a regulator of domestic industrial development. The state should protect free competition in the interests of domestic producers. The dominant idea is first of all money, and then the trade balance. Recognition of the importance of management activities for economic development.
Physiocrats	F. Quesnay. A. Turgot, F. Vizer	Physiocrats considered nature to be the main factor of production, and the role of agriculture in the economy was absolutized, since agriculture is an area of added value creation. Simultaneously with the “classical school” in terms of denying the activities of any institutions regulating economic relations; the laws of nature, the natural order in the economy were considered absolutely correct by the physiocrats
Classic school	A. Smith, D. Rikkardo,	Economic liberalism, the effective influence of the “invisible hand of the market” on the

	T. de Kvinsi	economy, the basis for the harmonization of personal and public interests. The source of wealth is not trade, but production, its main factors: land, capital, labor.
Neoclassical school	A. Marshal, J. B. Klark, A. Pigu, R. Solou, K. Menger, V. Pareto, G. Sedgvik	Free competition. Combining and updating classical theory and marginalism, they developed the conclusions that free competition ensures efficient production, but does not create conditions for fair distribution. Agree on the necessity and inevitability of state intervention.
Institutionalization	Veblen T. Kommons Dj., Adams G., Eyrs K. Erxart L., Gelbreyt Dj.	They considered the important problems of scientific and technological progress, focusing on the role of "technocrats" (engineers, scientists, managers) in creating a rational industrial system. It is with them that institutionalists associated the future of an effective economy. The role of the state in managing (organizing and stimulating) scientific and technological innovative development is increasing.
Neo-Schumpeterism	K. Peres	Identifying the relationship between financial crises, technological revolutions, and the wave dynamics of economic development. The dependence of the management of scientific and technological progress on institutional factors
Klassik boshqaruv	P. Druker	He proved the crucial role of scientific and technological factors in increasing labor productivity, which is especially important for developing economies. He emphasized the need for protectionist measures to support the economy.
Neoclassical synthesis	P. Samuelson	Criticism of Friedman's strict monetarism. Combining Keynesian ideas, supplementing the principles of neoclassicism, and using mathematical tools, they formed a centralized position in determining the relationship between the state and the private sector, bureaucracy and the market.
The theory of neoindustrialization	S. Gubanov, A. Amosov, Z. Antonova	The dominance of a state-corporate structure subject to the law of vertical integration, which ensures the priority areas of the economy are fully domestic industrial resources and value-added production chains.

The improvement of the industrial structures of the region is being carried out through the introduction and implementation of modern technologies into the activities of enterprises, government bodies and other types of production facilities. Also, in the next process, a digital market will be created. This will create the opportunity to connect manufacturers and users online based on modern technologies.

In the system of modern economic relations, knowledge and information are both products and means of production. “Science and education,” says V.L. Inozemtsev, “have become a direct productive force, and their carriers are the highest forces existing in society [11]. Relations associated with education and intellectual capital are an indisputable manifestation of human dignity.” This remains one of the important steps in the development of society. According to M.V. Chensova, the knowledge-based economy combines four economies [12]:

1. Post-industrial economy. The knowledge economy is dominated by the service sector typical of the post-industrial economy;
2. Information economy. The knowledge economy cannot function without information, it plays a key role;

He believed that with the further development of scientific, technological and information progress, the pace of life will increase even more, that is, the relationships between them will decrease (due to the development of the Internet), the change of professions will become commonplace, the life cycle of products will shorten, disposable goods will increase, and the service sector will take the lead.

Since Uzbekistan also aims to keep pace with the world's countries, it is impossible to achieve this without developing a knowledge economy. President of the Republic of Uzbekistan Sh. Mirziyoyev noted: “Since we set a goal to turn Uzbekistan into a developed country, we can achieve this only through accelerated reforms, science and education and innovation. For this, first of all, we need to educate a new generation of cadres who will take the initiative as reformers, think strategically, are educated and qualified.... Where there is no science, there will be backwardness, ignorance and, of course, deviation from the right path.”

Khasankhonova N. I. In her research, she showed the conditions for the development of a knowledge economy in Uzbekistan.

Therefore, the role of industrial structures in the development of the regional economy is considered very large. Therefore, one of the necessary measures based on modern approaches is to conduct a deep study of the theoretical and practical aspects of institutional knowledge.

2. Materials and Methods

The methodology of the article is grounded in a comprehensive and systematic research design that integrates institutional analysis, comparative evaluation, and econometric modeling to examine the efficiency of regional industrial structures and their role in shaping a competitive environment. The study begins with an institutional approach, assessing how governance, regulations, and organizational frameworks influence industrial modernization and the adoption of innovative technologies. By employing a systematic perspective, the research connects theoretical models with practical observations, ensuring that structural dynamics are not studied in isolation but as interdependent components of regional economic development. Comparative analysis is then applied to benchmark Uzbekistan’s industrial structures against global best practices, drawing insights from advanced economies such as the United States, Germany, South Korea, and Japan, where knowledge-driven economies and high-tech industries play a decisive role [13]. Econometric modeling is further utilized to evaluate the relationship between resource efficiency, technological adoption, and competitive performance, using both internal and external data indicators. The methodology emphasizes the use of analytical support systems, enabling a balanced consideration of the interests of internal and external stakeholders, while also applying profitability, cost-effectiveness, and comparability frameworks to achieve a multicomponent assessment of economic potential. In doing so, the study not only systematizes theoretical and empirical findings but also develops a conceptual model to measure the complex economic capacity of industrial enterprises. This integrative methodology ensures that the analysis captures the interplay of institutional structures, technological innovation, and economic performance, providing a robust foundation for policy recommendations aimed at sustainable industrial growth and regional competitiveness.

3. Results and Discussion

The advanced countries we know in the world, the USA, Germany, Great Britain, South Korea and Japan, are currently the countries that widely use the knowledge economy. In these countries, there is a high focus on investment in human capital, and science and high technology are widely introduced into the production and service sectors.

It should be noted that the difference between the institutional economy and the innovation economy is that if the former has knowledge, it becomes a valuable product that can be put on the market [14]. Secondly, knowledge is a prerequisite for creating innovations, but it is the main driving force of this type of economy, and thirdly, it is the constant introduction of innovative production methods into the economy, the sale and purchase of innovations, technologies. This stage of economic development is characterized by its own unique features. These are:

1. Knowledge (education, science) has become a new factor of production along with capital, land, labor and other classical factors. Knowledge is another factor of production.

2. The new generation of knowledge has become a completely new branch of production. Currently, knowledge (education, science) has taken on the form of a commodity.

3. Knowledge, which has taken the form of intellectual property, has become an important component of economic relations. On the basis of knowledge in the form of intellectual property, modern scientists have a specific goal and can be used in a specific field of production. Knowledge in the form of intellectual property is much more valuable as a product, since it appears not as a simple set of information about a particular phenomenon, but as a set of facts that can be used in practice to optimize various processes.

In this regard, the digital economy is an indispensable factor in the economic development of production. The level of formation of the digital space is associated with the maturity of the material and technological base. This shows that the level of technologies used in industrial sectors primarily determines the level of digitalization and automation. Industries that are equipped with both digital technologies and digital mutual benefits will ultimately be the most extensive and economically efficient, demonstrating rapid development.

It emerged not only from all previous forms of the economy, but also from the post-industrial economy as a post-industrial digital-information economy, characterized by the rapid development of scientific innovations, the abundance of electronic resources in the era of the current digital globalization of information, and the appreciation of mainly intellectual labor. To get a complete picture of it, we present the following diagram, see Figure 1.

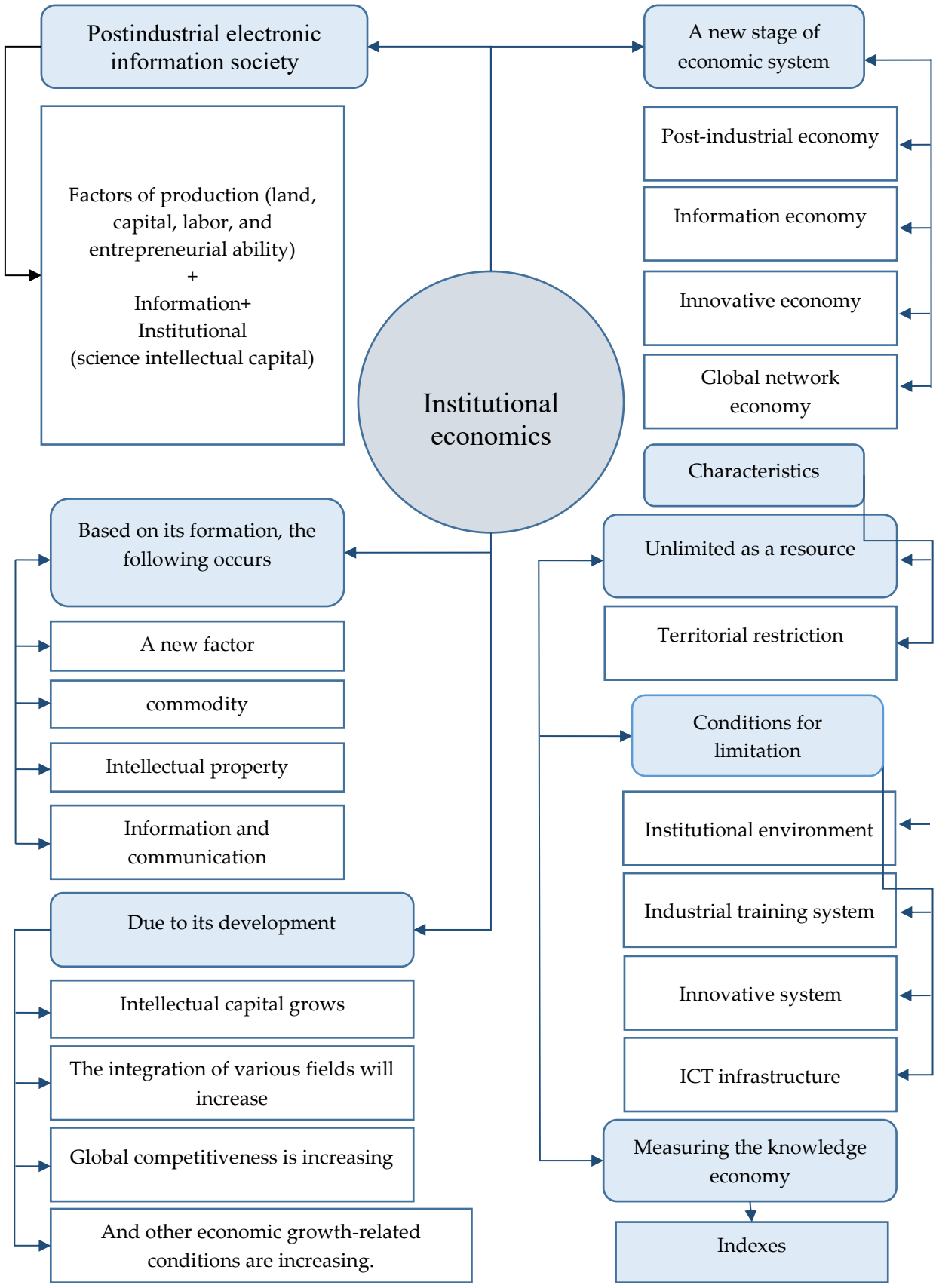

Figure 1. Mechanism for forming the institutional economy of the industrial structure of the region**.**

As we can see from Figure 1, we can reveal that the formation of an institutional economy relies on the following, and based on a retrospective analysis of the industrial

structure of the region, the views of scientists on economic relations and the management of scientific and technological progress are summarized in Table 1. If we look at the history of industrial sectors and their development in Uzbekistan, when talking about the historical development of industrial production and its main results, it should be noted that the development of "Home Industry" in the territory of present-day Uzbekistan began 12-15 thousand years ago - in the Mesolithic period [15]. During this period, very simple tools and products were made. In the post-war years, due to the focus on industrial development, a number of new sectors and enterprises emerged. Tractor manufacturing, fiber engineering, electrical engineering, gas production, household goods manufacturing, prefabricated reinforced concrete and ceramic industries emerged. The knitwear and porcelain production sectors of light industry were formed. Significant changes have occurred in the components of the food industry. By the 1990s, the number of large and medium-sized enterprises in this sector exceeded 300. Currently, extensive research is being conducted to analyze the development processes of industrial sectors using information technologies and to introduce automated systems into them.

For many modern economic theories, the terms “post-industrial society”, “information society”, “knowledge economy”, “institutional structure of industry” are considered in the works of D. Bell, E. Toffler, K. Drogobyskaya and a number of other scientists [16]. However, some terminological restrictions do not always reflect the essence of the views. Scientists do not deny the role and growth of the influence of production processes on the economy, agreeing with a number of conclusions made by representatives of the post-industrial development paradigm, it should be noted that it is theoretical.

In order to systematize the conceptual and theoretical foundations of managing scientific and technical progress in the industry of the region, it is necessary to understand how views on the significance and functional content of management activities have changed.

Local scientists are also conducting their own scientific research, conducting a broad assessment of the industrial structure in our region, analyzing the socio-economic processes of structural structures. Among them, it is appropriate to stabilize the oil and gas industry in our Republic, assess institutional changes in it, and search for new directions, see Figure 2

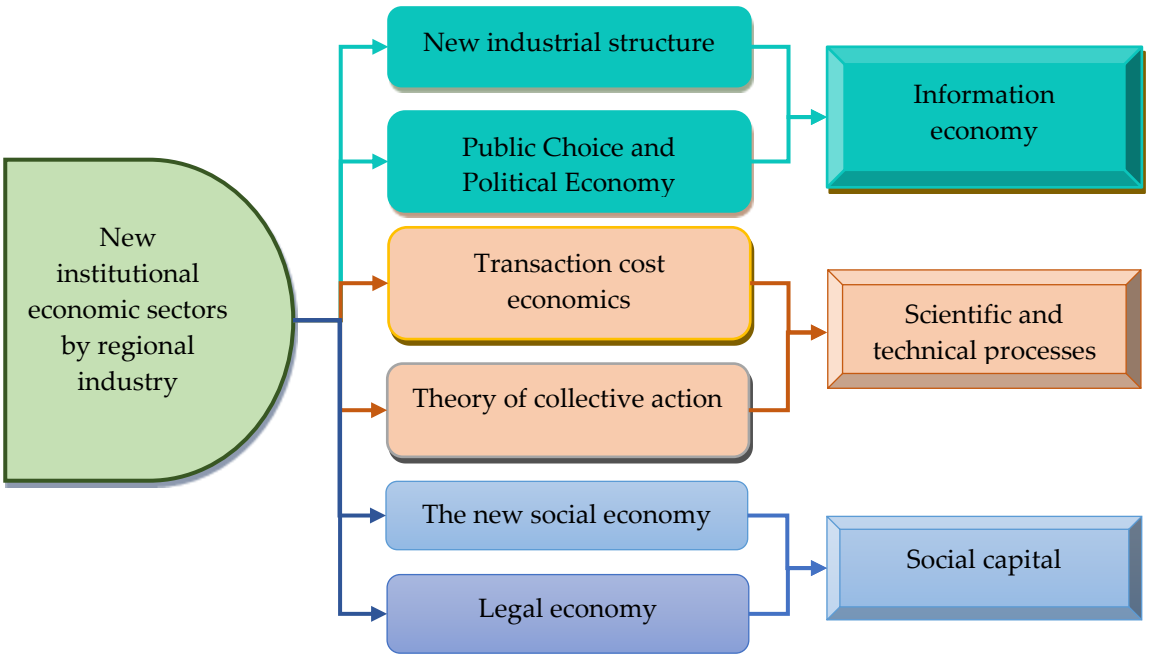

Figure 2. New institutional economic sectors

Based on the institutional structure of the regional industry, it is possible to determine the following aspects:

1. Social levels of labor distribution in industrial sectors;
2. Economic nature of the regional

4. Conclusion

The findings of the study confirm that institutional structures play a decisive role in enhancing efficiency and forming a competitive environment in regional industrial sectors, particularly through the integration of innovative technologies, digital management systems, and knowledge-based economic practices. The analysis demonstrates that sustainable industrial growth in Uzbekistan depends on the rational use of resources, the adoption of high-tech innovations such as nanotechnology and artificial intelligence, and the establishment of strong linkages between science, education, and industry, all of which collectively strengthen regional competitiveness and economic resilience. The implications of these results suggest that policymakers and industrial stakeholders must prioritize institutional reforms, invest in digital transformation, and support knowledge-driven development to ensure long-term sustainability and adaptability in the global economic system. Furthermore, the study highlights the need to create comprehensive mechanisms for evaluating industrial potential using profitability, cost-effectiveness, and comparability approaches, thereby improving decision-making at both enterprise and policy levels. However, while the research provides valuable conceptual and practical insights, further studies are needed to empirically test the proposed models across different industrial sub-sectors, to analyze the long-term socio-economic effects of digitalization, and to explore the balance between state regulation and market self-regulation in shaping future industrial competitiveness.

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