

# THE ROLE OF INFORMATION TECHNOLOGY MECHANISMS IN IMPROVING THE EFFICIENCY OF INNOVATION IN INDUSTRIAL ENTERPRISES

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**Annotation:** *This article is about the key insights and understanding of improving the efficiency of innovation in industrial companies and the role of developing technologies with the greatest impact on the future of production. The definition of innovative business processes was provided. Their target direction and informational interconnection were distinguished. The scientific-methodical approach to assessing the effectiveness of the information technology implementation in the innovative business process, is proposed.*

**Keywords:** *Information systems, technology, 3D technology, industrial enterprises, enterprise management, efficiency, business processes, innovation.*

Today, we live in a vibrant and tempestuous global community, where innovations have been the primary chores of humanity throughout history. Therefore, continuous efforts in innovations have remained imperious for improvement in quality of life and survival. Similarly, all the major innovative waves in human history like industrial, information and agricultural innovations have been made for better value creation.

As we know, the basis of sustainable development of any country is innovation. Since the 1980s, the world has entered a new stage of development, the era of globalization. This is due to the expansion of domestic and international markets, technological innovations, the need to create computer technology, the development of new means of communication, and in the 90s with the emergence of the Internet today with billions of users.

Today's globalization process has intensified competition, shortened the period of new product creation, and forced companies to rapidly develop new innovative products (technologies, materials, machinery, engineering, transportation and communications, pharmaceuticals, agriculture, and other products).

Integration of science and industry, cooperation between private entrepreneurs and the state, support for international relations of small and medium-sized innovative businesses are important conditions for the broad

development of innovative activities. It should be noted that in the developed countries of the world, almost half of the innovations are carried out by organizations, small and medium-sized businesses.

The process of integration of science and industry is most effective only when universities and technical institutes, together with manufacturing companies and firms, determine their share in patented development and implement research and innovation projects. World experience shows that only in countries with a comprehensive innovation system, innovation processes are carried out effectively, technologies and other popular products are commercialized. The participation of the state in this process, the real sector of the economy and the support of innovative activities of leading companies are important. Indeed, science is the basis of this integration mechanism, which ensures the technical progress of the state and the socio-economic development of society.

The decrees and resolutions, adopted by first President Islam Karimov have become a special stimulus, for the consistent implementation of state policy in the field of science, technology and innovation in line with new historical realities. The Resolution of the first President of the Republic of Uzbekistan dated July 15, 2008 "On additional measures to encourage the introduction of innovative projects and technologies in production" has become important in this regard. This decision serves to create a system of targeted funding of research projects in our country and the provision of scientific laboratories with modern equipment, modernization of enterprises and the establishment of a fund of new technologies, as well as holding national innovation fairs. In order to create favorable conditions for the training of young professionals in our country, the necessary measures have been taken to further strengthen the material and technical base of scientific institutions [1].

The high intellectual potential of science and high-tech developments are the basis for the development of an innovative economy. The reform of the science management system in Uzbekistan has made it possible to create a practical mechanism for the development of innovative work aimed at conducting fundamental and applied research, the introduction of new developments and their practical application. The fairs of innovative ideas, technologies and projects, traditionally held at the initiative of first President Islam Karimov, include the introduction of applied research and commercialization of their results, close cooperation between science and industry, developers and consumers of innovative products has become one of the important mechanisms of supply.

To accelerate the commercialization of the best national developments with great economic benefits, it is necessary to create new innovative structures (research and interdepartmental centers, high-tech centers,

technology parks, start-up firms, etc.), as well as enterprises that implement them. The acceleration of the innovation process provides additional advantages in the fight for the trade market. After all, today only those who introduce innovations faster than others will succeed [2].

In order to ensure innovative development in industrial enterprises, it is necessary to develop innovative development programs of the network with a clear indication of the deadlines. In this program, it is necessary to indicate the following areas of innovative development:

- whenever possible, build various enterprises that process products on the basis of technology in the country, because this in turn significantly increases the volume of output that reaches buyers;
- modernization of enterprises into production types on the basis of innovative technologies – this ensures that the volume of production of new products will be increased, their different districts;
- build new innovative enterprises on the basis of studying and mastering the experience of developed countries.

The five technologies, in different stages of technical readiness and adoption, also come with varied levels of uncertainty about their future direction. Disruptive technologies, especially robotics, 3D printing and augmented reality, have captured the popular imagination with exciting applications demonstrated across all sectors. However, behind the individual use cases, the readiness and adoption of each technology tells a different story [3].

– Artificial intelligence enables producers to make sense of the overwhelming data that their factories, operations and consumers generate, and to transform that data into meaningful decisions. Today, 70% of captured production data goes unused. Applying artificial intelligence to the connectivity of internet of things, producers are able to orchestrate and streamline business processes from desktops to machines, across department walls and tiers of suppliers. The most promising immediate opportunities for applying artificial intelligence in production systems are in quality management, predictive maintenance and supply chain optimization. AI-enabled products will be a game changer for value propositions addressed to customers, and producers must be ready to orchestrate the value networks required to deliver these[4].

– Advanced robotics have long handled the “dull, dirty and dangerous” jobs, and currently automates 10% of production tasks. Robots were often separated from people for safety reasons, but now, a new generation has “come out of the cage” for 24-hour shifts, working alongside human counterparts. Increasing returns on investment, insatiable Chinese demand and advances in human-robot collaboration will increase their adoption to 25-45% of production tasks by 2030, beyond their use in the automotive and electronics industries. Adopting advanced robotics and AI could boost

productivity in many industries by 30%, while cutting labor costs by 18-33%, yielding a positive economic impact of between \$600 billion and \$1.2 trillion by 2025 [5].

The application of innovative technologies in industrial enterprises is such a wide and large-scale issue. I would like to dwell a little bit on the modern innovative technology - 3D - which is currently developing rapidly. Most often when it comes to this, many begin to remember 3D-chips. But now the concept of 3D-shuter, 3D-sound, 3D-picture or image and 3D-printer has also come to life. The principle of operation of 3D-printers means the creation of a copy of any subject on a folding printer using some kind of material. The first 3D-printer was developed at the USA Massachusetts Institute of technology. Currently, there are many of its types and models, and there are also compact types that are used in home conditions. The reasons why 3D printers are becoming increasingly popular are as follows:

- the fact that raw materials are easy to find;
- relative ease of use of printers;
- reliability and durability of the objects being created;
- to meet the environmental requirements of the work performed;
- the fact that the process of creating a physical model is not so expensive [6].

For this reason, 3D-printers are increasingly widely used in the following directions:

- in Mechanical Engineering and the creation of prototypes of objects;
- architectural chores and design;
- in the formation of copies of various equipment and objects in engineering work;
- in the production of films and cartoons create personages and shoot them;
- in the development and testing of various spare parts in the aircraft and Space Industries.

Therefore, the technology of 3D-printers has been developing year by year and application areas are becoming more and more. Proceeding from the foregoing, we can say that 3D technologies create the opportunity to increase the efficiency of any production process several times, as well as to produce various industrial products at affordable prices on the basis of individual orders [7].

Even in the food industry, which is one of the most important industrial enterprises of the present day, there are a lot of technological innovations in the field of cultivation, storage, processing, preparation of products, their nutritional value, storage, preparation of artificial feed products and many other areas. When it comes to talking about ultrasonic vibrations, which are one of the main ones, it can change the aggregate state of the substance, transfer it to a state of dispersion, change the diffusion rate, dissolve the

substance or bring it to a state of Crystal, activate chemical reactions, as well as intensify technological processes. The impact of ultrasound accelerations on the physical and chemical processes in the food industry leads to an increase in labor productivity, a reduction in energy consumption, an improvement in the quality of the finished product, a change in its shelf life and the creation of new products with good consumer performance [8].

The application of the process approach and the construction of a set of business processes are needed when using modern information technology management and the latest innovative approaches in all spheres of the functioning of social production systems. Application of situational, functional, complex and other integrated approaches allows to optimize current management decisions within the limits of the industrial enterprise and to form a single information space of its activity. Thus, the innovative difference of the practical implementation of the process approach from the functional is that the focus of management is not on individual functions performed by different departments and officials, but on inter functional processes that combine individual functions into common flows and ensure the achievement of enterprise goals. It is these process-oriented features that are capable of generating innovative ideas and creating a broad field for their implementation. In modern scientific thought there is no definite approach to the definition of the concept of "business process". Some scientists, define the business process as a set of different types of activities, within which the planned types and amounts of resources used as the "input" and a product, which is valuable to the consumer, is created as a result of this activity at the "output".

In short, the modern concept of process management, involves the transformation of the enterprise business for closer coordination of its functional parts, increasing their flexibility and obtaining a synergistic effect, providing a successful environment for the implementation of production tasks and the introduction of various types of innovations. In order to increase the efficiency of activities and achieve strategic goals, industrial enterprises need to reorganize the management system based on a process approach and pay special attention to the development and improvement of innovative business processes in the context of the introduction of modern IT.

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## **«ИНДУСТРИЯ 4.0» В РЕСПУБЛИКЕ УЗБЕКИСТАН: ПЕРЕХОД К ЦИФРОВОЙ ЭКОНОМИКЕ И РАЗВИТИЕ ИСКУССТВЕННОГО ИНТЕЛЛЕКТА**

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**Аннотация:** В данной статье, анализируются актуальные аспекты трансформаций в экономической сфере, которые могут произойти в четвертой промышленной революции при внедрении технологий Индустрия 4.0 в том числе переход к цифровой экономике и применение Искусственного Интеллекта (ИИ) в Республике Узбекистан.

**Ключевые слова:** четвертая промышленная революция, Индустрия 4.0, экономическая сфера, цифровая экономика, цифровая трансформация, искусственный интеллект.

После трех ускоряющих промышленных революций, наступила четвертая – согласованная совместная работа машин, людей и процессов, объединенных в сеть.

В рамках Индустрии 4.0 реальный мир машин соединяется с виртуальным миром Интернета и ИТ.

Индустрия 4.0 – это следующий шаг в эволюции производства, основанный на идее, что машины должны иметь возможность общаться друг с другом и работать вместе для создания новых продуктов и услуг.

Решения Индустрии 4.0, также известные как четвертая промышленная революция, уже навсегда меняют наш образ жизни и работу и оказывают огромное влияние на мировую экономику.

Индустрия 4.0 – это применение технологий для цифровой трансформации работы промышленных компаний. Эти технологии включают промышленный Интернет вещей, автоматизацию и робототехнику, профилактическое обслуживание, моделирование, аддитивное производство и аналитику Интернета вещей.