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The Fourth Industrial Revolution

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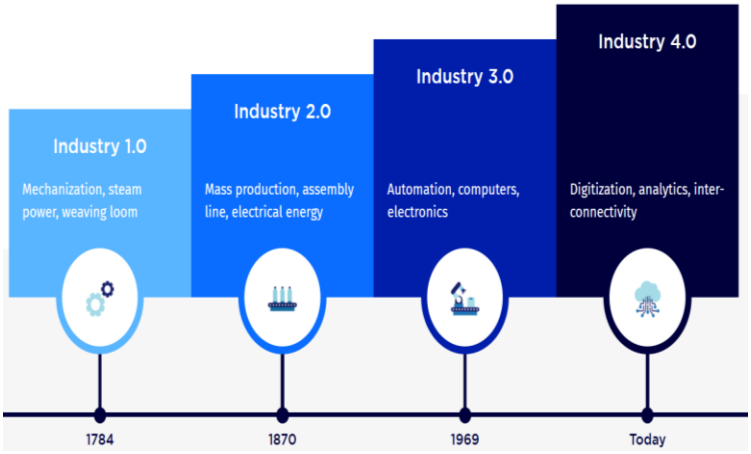
Abstract: This article describes the essence of the fourth industrial revolution, its technological foundations and its impact on industrial production processes . The fourth industrial revolution is modern technologies, including cloud computing , artificial intelligence, robotics based on automation and optimization of production. The article analyzes the main advantages of the fourth industrial revolution, such as increasing the efficiency of industrial production, ensuring flexibility and reducing costs . Staffing shortages, cyber security and investment issues related to the transition to new technologies are also addressed. The influence of the fourth industrial revolution on the world economy, in particular, how much it affected the development of the economy of Uzbekistan is considered.

Keywords: Industry 4.0, digital transformation, artificial intelligence (ai), big data, robotics, global technologies, industrial revolution, production efficiency.

Introduction

Industrial revolutions are stages that dramatically changed the production technologies of mankind. The word "revolution" means drastic and fundamental changes. From the beginning of mankind to the present day, the development of technology and new inventions in the industry have caused many revolutions. The first industrial revolution began with the invention of the steam engine in the 18th century, leading to the mechanization of labor processes. The second revolution continued in the 19th century with the widespread use of electricity and the emergence of mass production systems. The third developed in the 20th century with the widespread introduction of computers and automated systems. At present, mankind has entered the fourth industrial revolution. The term Fourth Industrial Revolution was first coined by a team of scientists developing a high-tech strategy for the German government. The term was first introduced in Germany in 2011 and announced at the Hannover Messe industrial exhibition. This concept involves raising production to a new level of quality through automation, data analysis, artificial intelligence, big data and other advanced technologies.



Industry 4.0 technologies aim to significantly increase efficiency by digitizing and automating production processes. The main feature of this era is that now not only machines, but also systems, devices and equipment communicate with each other connected to the network. Innovative solutions such as the Internet of Things (IoT), artificial intelligence (AI), big data, robotics, and cloud technologies are leading the industry to new developments. These technologies create new opportunities in production processes and are gaining importance in ensuring competitiveness of enterprises.

Review of literature on the subject

Klaus Schwab, the founder and executive chairman of the World Economic Forum and its world-famous meetings held annually in Davos (Switzerland) said, "In terms of size, scope and complexity, the phenomenon called the 'fourth industrial revolution' has never been experienced by mankind." it does not look like a single process" he said [1]. Also, some scientists and specialists considered the changes covered by Klaus Schwab to be just a part of the third industrial revolution. However, Klaus Schwab emphasized that the fourth industrial revolution is different from the previous ones, and gave 3 reasons for this: speed, breadth and depth, systemic impact.

The Fourth Industrial Revolution United Nations Sustainable Development It provides transformational opportunities that contribute to the achievement of its goals. Industry 4.0 technologies provide enterprises with the rational use of information and data, in the long term based on the identification and tracking of smart products throughout the supply chain allows to be competitive and thus overproduction and transport reduces costs and waste and energy consumption [2].

Uzbekistan's development strategy until 2030, "Uzbekistan - 2030", provides a number of important guidelines about the industry and its impact. The strategy aims to diversify the economy, introduce advanced technologies and automate the industry. In Uzbekistan's long-term development strategy, increasing production efficiency and preparing for digital transformations through the use of industry is of particular importance. This includes, for example, the wide implementation of technologies such as artificial intelligence, robotics, and big data in production . The word "industry" defined above refers to Industry 4.0, that is, it is intended to develop Uzbekistan's industry and ensure the well-being of the population by rationally using new industrial technologies.[3]

Research methodology

Methods widely used in scientific research methodology were used in the implementation of these research works. In studying the fourth industrial revolution brought revolutionary changes

[1] Klaus Schwab (2016) , The Fourth Industrial Revolution, Portfolio 2017, 192 p.

[2] Waibel, NW, Steenkamp, LP, Moloko, N., and Oosthuizen, GA 2017. "Investigating the effects of smart production systems on sustainability elements". Procedia Manufacturing, 8, 731-737.

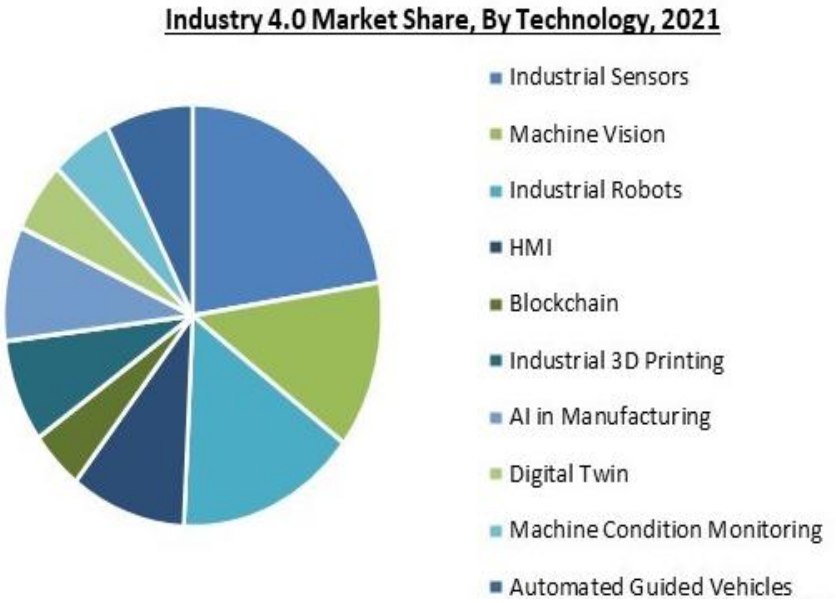
[3] Decree of the President of the Republic of Uzbekistan, "Uzbekistan-2030" strategy, https://lex.uz/docs/-6600413

to the development of technology and the impact on the growth of the economy of many countries, it is effective to use deduction or induction methods in the order from generality to individuality and vice versa, while the method of abstract-logical thinking is a systematic analysis of the process is important in doing. In the process of scientific analysis, one of these scientific research methods, in particular, scientific abstraction, induction and deduction, systematic and comparative analysis, expert assessment and economic-statistical analysis, synthesis and analysis methods were widely used.

Analysis and results

The fourth industrial revolution was one of the revolutions that had a great impact on the economy and industry of many countries on a global scale. Therefore, industry 4.0 has created many opportunities and problems, conveniences and inconveniences. The most common of these negative aspects is social inequality. It is difficult to know the extent of the problems behind such inequalities, because most people in the present age are both producers and consumers. Based on this, it can be said that new innovative technologies and radical changes in the field of industry have a negative and positive impact on our lives.

Following the improvement of industrial technologies, industrial enterprises in many countries are abandoning manufacturing (manual labor) and preferring to use new innovative technologies instead of workers. Many problems arise from this, for example, the increase in unemployment, the decrease in the quality of products, the need for skilled workers. The development of innovative technologies, especially the widespread use of automation and robotics, is leading to a reduction in manual labor in industrial enterprises. Over the past few years, the share of workers in GDP (gross domestic product) has been sharply reduced in most developed countries, as well as in rapidly developing countries such as China. Half of the decrease is due to the decrease in the relative price of investment products due to the innovation process [4]. Automation speeds up production processes and reduces workers. For example, assembly line workers and other low-skilled workers could be replaced by robots. The introduction of innovative technologies can increase efficiency in product production, but in some cases it can lead to a decrease in product quality. A careful approach is necessary when using new technologies, because sometimes they cannot replace the necessary quality control of human labor.



The era of Industry 4.0 creates new opportunities for increasing economic efficiency through digitization and automation of production. This process emphasizes the following key aspects in the transformation of industrial enterprises and the national economy:

[4] Carl Benedict Frey and Michael Osborne, Technology at Work - The Future of Innovation and Employment, sponsored by Citi Research, Oxford Martin School and City, February 2015

Technological integration and efficiency:

Industrial enterprises have the opportunity to improve production processes through the use of artificial intelligence, IoT (Internet of Things), and digital platforms. As a result, product quality increases and production costs decrease. For example, some enterprises in Uzbekistan increased efficiency by 20-30% through automation at the initial stage .

Employment and Skill Changes:

Technological development is demanding new occupations and skills in the labor market. This increases the need for the workforce to acquire digital skills. However, the automation of repetitive tasks may increase the risk of unemployment.

Stimulating investments and innovation:

The implementation of Industry 4.0 technologies requires a large investment, but in the long term it stimulates economic growth. Programs for the introduction of innovative technologies in Uzbekistan are aimed at accelerating this process .

Increased competitiveness:

Enterprises using Industry 4.0 are flexible to market requirements and have the opportunity to increase competitiveness. In particular, manufacturers are strengthening their position in the international market through digital systems.

Conclusions and suggestions

The era of Industry 4.0 is creating significant changes in all aspects of the economy by automating and digitizing production. The introduction of modern technologies plays an important role in increasing economic efficiency, accelerating innovative development and strengthening competitiveness in the global market. At the same time, this revolution is demanding new skills in the labor market, creating problems related to social inequality and cyber security. A flexible and strategic approach of society and the state is necessary to get the maximum benefit from the possibilities of Industry 4.0.

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