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World Industrial Revolutions and the Development of Artificial Intelligence System

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The objective-scientific conclusions obtained from the researches conducted in various fields of science prove that era and worldview are in unity and are phenomena that determine one another, and era and worldview are the most important phenomena in the understanding of geniuses, historical events, including personalities who have left a mark on the history of politics, and every individual as a whole. And it is appropriate to briefly consider the problem in the context of human and personality factors. It is known that man has tried to understand natural phenomena since the beginning of time. Contact with the material world naturally affects his consciousness and even his subconscious as he solves problems that are important or useful for human life. During this understanding, the worldview changes and is formed. Thus, depending on the material and moral development of all spheres of life, the content and essence of the progress events, as the civilizations replaced each other in different periods, the event of periodization took place and became a system. If we take Europe, the people of the Ice Age of 300,000 years ago, who engaged in hunting to solve their hunger needs, in other words, the age of dinosaurs, have spread to many parts of the world from Africa, where they lived in order to survive and meet more of their daily needs. The extensive integration of agricultural Ice Age People into the Earth included farming, fishing, animal husbandry, hunting, as well as handicrafts, etc., and has led to the revolutionary development of the fields[1]. As economic activities led these first inhabitants of the planet from caves to less comfortable shelters, then to good houses, then to palaces, labor activities in various occupations, including crafts, developed rapidly. Thus, the fads of the era who differed from the crowd (later this class will be called personalities, geniuses...-Kh.G.) began to appear. If we approach the issue from the point of view of history, we witness that the world view determines the development in different periods. This idea can be expressed in such a way that each period can be considered to have developed or experienced a crisis according to the level of worldview. In this direction of our thoughts, the question arises: So, what is the phenomenon of worldview of this era—XXI century? Based on the general content of the current events, characterized as the globalization stage of the modern world, we can say that the outlook of the historical stage we live in is based on the achievements of the last stage of the industrial revolution. In this article, by analyzing the history of the artificial intelligence system during the world industrial revolutions, we will study both the concept of progress of the industrial revolutions and the progressive and at the same time regressive development of the artificial intelligence system.

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[1] Ice Age. https://www.history.com/topics/pre-history/ice-age.

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Introduction

Stages of economic development known as industrial revolutions, which are the source of socio-economic well-being that create and shape the worldview, are a characteristic phenomenon, for example, the First Industrial Revolution, the Second Industrial Revolution, the Third Industrial Revolution, and the Fourth Industrial Revolution which is taking place in our modern times.

In this way, the industrial revolutions, which have been left behind, have reached their current historical level by developing the outlook of mankind—Industrial Revolution 4.0.

Artificial intelligence, the most important phenomenon of the modern era in XXI century, and the development of computer creativity, which is an integral part of it, coincides with the First Industrial Revolution. Thus, scientists of the history of modern science appeared in the first decade of the 17th century, and in the twenties of the 19th century, they spread to the whole world. During the Enlightenment period, especially in the years 1600-1850, artificial intelligence in Europe has enriched this field with valuable scientific innovations by benefiting from three important theoretical-methodological experiments. First of all, we should emphasize that the dialogue between artificial intelligence and human consciousness has left its traces in myths and folklore. As for rational scientific thought, the first studies and discoveries of this human phenomenon are associated with the name of European scientists.

> For example, modern world science (1623) is a machine that serves to fulfill several different functions, including arithmetic operations that greatly lighten human labor, including the first mechanical calculator and a system for learning Hebrew grammar by Wilhelm Schickard, a prominent German mathematician, theologian, and cartographer. That is, they accepted and highly valued important scientific discoveries from the invention of a device called a calculating clock, which allows to perform mechanically.
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> Also, in 1822, Charles Babbage, a European mathematician, philosopher, inventor, mechanical engineer, economist, computer scientist. Charles Babbage won the Gold Medal in 1824 in the nomination “for the invention of an engine for calculating mathematical and astronomical tables”. Even today, world science benefits from the concept of the digitally programmable computer invented by Charles Babbage, who is considered the “father of the computer”, in other words, the father of modern printers and the pioneer of calculating machines. (Guliyeva, 2023, p. 368)

Charles Babbage’s discoveries of artificial intelligence “machines”, which played an important role in the founding of the Astronomical Society of London (known as the Royal Astronomical Society) two centuries ago, were cut short by his death, but remain important as a major source for new scientific research, on display at the Science Museum in London.

The dynamic development of the First World Industrial Revolution from 1760 to 1820-1840 in European countries and the United States created the Second World Industrial Revolution from the middle of the 19th century. Starting from 1914—that is, from the period of the First World War, the Third Industrial Revolution rapidly accelerated the phenomenon of economic, economic-military, and socio-economic progress throughout the world. Later today—the fourth industrial revolution, a global phenomenon of the modern era, has changed human life and formed a new worldview. At the same time, the 4th İndustrial Revolution is making the calls of the 5th İndustrial Revolution and even the 6th İndustrial Revolution by rapidly moving forward with the huge technological innovations of the 21st century.

Thus, it would be appropriate to familiarize yourself with the history and current state of the industrial revolutions and artificial intelligence system.

Main Part

The world war and subsequent human order, the stage of attempts to escape the global crisis manifested itself in parallel with the Third World Industrial Revolution. For example, scientists, experts, artists, etc. the results of the most important scientific and technical revolution of the 20th century, which unquestioningly confirm its efficient operation, the industrial revolution in machine production, the creation of automatic factories, from automobile transport to aviation, radio, television, etc. advances in communication, as well as the invention of pistols, assault rifles, machine guns, tanks, chemical weapons, modern weapons from the Ak-1, Ak-2 to the GIG-44 and Ak-46 to the Kalashnikov, including artificial intelligence systems, computers, the Internet reconstruction of various fields of communication, medicine and chemistry, radical reconstruction of important chemical fields, as well as space research, electronic computing, information-cybernetics, socio-economic field—sports, international Olympic movement, science, education, music, painting, sculpture, theater, cinema, entertainment, and other fields are unique revival examples. Of course, all this progressive development has formed generations of people with a new outlook.

The Third Industrial Revolution ushered in the application of the scientific-theoretical and experimental foundations of nuclear energy, powerful industrial automation devices in the field of electronics, the first computers, calculation-programming machines, as well as the first industrial automation devices. Machines and robots in automated factories and mills were examples of new development and indeed progress.

Of course, the III World Industrial Revolution began to write its history on the most basic Artificial Intelligence system. The three important periods of the artificial intelligence system that took place in the 1900-1950s continued with phenomenal events.

The first of these was founded in 1924, with the full name International Business Machines Corp or IBM for short, which was founded in 1911, and which represents the technological progress of the time, aimed at leadership in software solutions, hardware, and services, and mainly punched card counting machines, which was a much improved form of a developing system.

After that comes the “Turing machine” case of artificial intelligence, already in 1936—Alan Mathison Turingin’s name.

Thus, after IBM, in 1936, Alan Turing’s “Turing machine” was born, and this discovery is essentially a computational model that is connected to the Internet, and therefore to the virtual world, which is now an inevitable part of our lives: computers, mobile phones, tablets, and includes the idea of the origin of video cameras, digital cameras, and other such technologies.

With the creation of the “Turing machine” in the 30s of the 20th century, a serious ground was prepared for the implementation of infinite and complex mathematical calculations with the algorithm programs founded by Al-Khwarizmi in Europe.

If we pay attention, the important “machines” of the phenomenon of artificial intelligence, up to Alan Turing’s “Turing machine” in 1936, were created in Europe, mainly in England, which confirmed and accompanied the worldview of the industrial revolution. In 1943, during World War II in America, the first functional digital computer called ENIAC was created for military purposes.

After that, it was necessary for influential scientists to come together to analyze and evaluate the discoveries in the field, to clarify the goals ahead, and in 1956, he became famous as the co-founder of the artificial intelligence laboratory of the Massachusetts Institute of Technology at Dartmouth College, one of the most prestigious colleges in the United States of America, and the author of a number of works on artificial intelligence and philosophy, Turing Prize winner (1969) Lee Minsky, American scientist, author of the term "artificial intelligence", creator of the LISP language and functional programming, Turing Prize winner (1971) John McCarthy and as the "father of information theory" famous American mathematician, electrical engineer, and cryptographer Claude Elwood Shannon organized the first conference on artificial intelligence (Guliyeva, 2023, p. 368).

After that first Dartmouth College conference in 1956, a deep gap was observed in the history of artificial intelligence until the period of 1970-1980, known as "Expert systems".

Futurists specifically attributed this crisis situation in the field of artificial intelligence system to the years 1974-1980 and called it "the first winter of artificial intelligence".

In the history of artificial intelligence, like the first winter of crisis, the second winter is also celebrated.

In the last seven years of the 20th century, about one decade, the great achievements of artificial intelligence are represented by "Smart agents" digital electronic devices, which are among the achievements of the Third World Industrial Revolution.

Thus, the Artificial Intelligence system, after the second phase of the crisis called "Second Winter", covering the years 1987-1993, with the great influence of Japan, as well as the large-scale investment of powerful investors, the most important achievement of the Third World Industrial Revolution, "Smart Agents" is the renaissance of digital electronic devices. This renaissance once again confirms the irreplaceability of the inventions and experimental school of Alan Turing, the great creator of Artificial Intelligence, mathematician, logician, and the thought of returning to it in the 21st century.

The Result

Thus, as in every field, the IV World Industrial Revolution has a tradition of predecessors and successors. This is Industrial Revolution 5.0 and even its sequel, Industrial Revolution 6.0.

İn the "Changes and improvements in Industry 5.0: A strategic approach to overcome the challenges of Industry 4.0" the general characterization of Industry 5.0 is given as follow:

> Industry 5.0 is an attempt to revive the presence of the human workforce in the factories, where man and machine would work in conjunction to increase the efficiency of the process by making full use of human brainpower and creativity through their integration with the present intelligent systems [44]. One of the main aims of Industry 5.0 is waste management by using Industry upcycling. Industry 5.0 includes the interoperability of Network sensor data, an improved version of Industry 4.0 with newly added features. Some of them are Smart Additive Manufacturing, Predictive maintenance, Hyper customisation in the Industry, Cyber-Physical Cognitive systems, and the introduction of Collaborative Robots [45]. (Khan, Haleem, & Javaid, 2023)

Analysts analyze Industry 5.0 extensively. The received scientific conclusion is that in the Industry 4.0—IV Industrial revolution, the creative consciousness of Man will prevail and will raise the tradition of artificial intelligence and technologies to the highest level of progress. Man will somehow sacrifice his power to his own creation. With the power of his consciousness, a person will create conditions to decide himself in the second plan.

Currently, Industry 4.0—the Fourth Industrial Revolution is taking place all over the world, and this system, which is strong in socio-political content and essence, will fundamentally change the way we live, work, and communicate with each other, leading us to artificial intelligence, robotics, cyber security, etc., will continue to surprise with technological achievements in wide fields and on the other hand with events that will change the world.

The scientific-objective conclusion we reached when completing our analysis confirms the breadth of human consciousness in material and spiritual terms. When the worldview is followed in accordance with new scientific methods, the basic experience is determined by the fact that the objective attitude of the individual to ongoing world events can be explained down to all its "secrets".

Thus, the subject of "World Industrial Revolutions and the Development of Artificial Intelligence Systems" remains as real and important today as it has always been.

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