

Laman Sifada NOVRUZLU

Azerbaijan State University of Economics (UNEC)

Master in Marketing

E-mail: lamannovruzlu9@gmail.com

THE FOURTH INDUSTRIAL REVOLUTION IN AZERBAIJAN

Abstract

At present, humanity is living in a period of great changes, where large-scale, complex and amazing technological innovations are developing rapidly, and artificial intelligence is entering various spheres of our lives. We have left behind the three industrial revolutions that already included the invention of the steam engine, electricity, the computer and the Internet, and the fourth industrial revolution, based on artificial intelligence, robots, the Internet of Things, autonomous machines, three-dimensional printers, nanotechnology, biotechnological science and scientific breakthroughs since the end of the 20th century. we are in the era of revolution. Questions about what this revolution promises to people, companies, countries and the world as a whole, and how to use its creative ability, are currently the subject of wide intellectual discussions.

Keywords: *information technologies, fourth industrial revolution, robotics, internet, cloud computing.*

UOT: 330

JEL: O 00

DOI: <https://doi.org/10/54414/FXKB9890>

Introduction

The Fourth Industrial Revolution, the name of which we have often heard in recent times, tells us about a series of social, political, cultural and economic developments that will take place in the XXI st century. Building on the proliferation of digital technologies as a result of the Third Industrial Revolution, the Fourth Industrial Revolution will be largely driven by a combination of digital, biological and physical innovations.

The scientific and technical progress of the XXI century, the rapid development of productive forces, the high level of concentration of production and population in large and large cities have had both positive and negative consequences.

In this regard, the application of the results of ETT in production and the structural changes occurring in our national economy increase the importance of forecasting, and at the same time, it requires the clarification, grouping and improvement of the issues raised in many existing methodical indicators and the methods of its determination [2].

Application of the results of ETT in production and the structural changes occurring in our national economy increase the importance of

forecasting, and at the same time require clarification, grouping and improvement of the issues raised in many existing methodical indicators and methods of its determination.

In order to better understand the nature of the Fourth Industrial Revolution, I think it is necessary to first look briefly at the three industrial revolutions that preceded it. The First Industrial Revolution refers to the industrial revolution that emerged in Europe from the second half of the 18th century, based on steam and water power, and which led to the mechanization of manufacturing production. It was undoubtedly a great revolution and it is at the foundation of the process of industrialization in the world economy. The Second Industrial Revolution refers to the emergence of conveyor-based mass production based on electricity from the first half of the 20th century. In the second half of the 20th century, the development of electronics, programmable logic controllers (PLC), information and communication systems, and robots gave rise to the Third Industrial Revolution. This revolution ensured the automation of production based on the mentioned achievements.

The Fourth Industrial Revolution has emerged since the beginning of the 21st century based on

the achievements of digital technologies. This revolution makes autonomous decision-making of cyber-physical systems via cloud-based machine learning at producing process. So that enables the emergence of "smart factories" which can autonomously make decisions about market research, production and sales. The Fourth Industrial Revolution has emerged due to machine learning, artificial intelligence, three-dimensional printing (3D printer), robots, unmanned aerial vehicles and vehicles, blockchain technology, neurotechnologies, implantable technologies, cloud technologies and other revolutionary technologies [1].

Of course, we cannot explain here the importance of each of these technologies in terms of household and economy. But in my opinion, it is crucial to emphasize one point. Thus, in the Fourth Industrial Revolution, these revolutionary technologies come together and lead to the emergence of new technologies of an unprecedented revolutionary nature, and this process continues without interruption. It is no coincidence that the world has already begun to discuss the concepts of the Fifth Industrial Revolution, "industry 5.0" or "society 5.0". This concept already implies the formation of production and society based on the joint cooperation of people and machines. Such a society is not so far away, and I think that we will witness serious results in this direction in the next 10 years.

Steps of the Fourth Industrial Revolution in Azerbaijan

We would not be wrong if we say that the Fourth Industrial Revolution confronts us with important challenges in almost all areas of social life. Today, it is impossible not to see the challenges this revolution has created for each of the human-human, human-government and human-nature relations. It is no coincidence that concepts such as "smart government", "smart city", "smart village", "smart factory", "smart car", "smart phone" have started to appear in our lives and we are witnessing their rapid spread.

The most common challenge here is that while individual components can be imported, "industry 4.0" as a whole cannot be imported. The components including fourth industry such as "Smart government", "smart village", "smart city", cannot be imported. These should be formed in the country itself. For this, the physical infrastructure,

human capital and institutional infrastructure of that country should allow it. Azerbaijan is a country of young people, a society open to innovation. This is a great opportunity for us. But as I mentioned, more factors need to come together for the Fourth Industrial Revolution to take root in the country. I think that the process of restoration and reconstruction of Karabakh in the coming years is a great opportunity for us in this regard. This presents us with a great test opportunity in terms of applying the achievements of the Fourth Industrial Revolution. As you know, the Azerbaijani government has already declared that it will turn Karabakh into a paradise based on concepts such as "smart city", "smart village", and "green energy".

The impact of the Fourth Industrial Revolution on the labor market

One of the areas where the important challenges of this revolution have emerged is the labor market. These technologies are causing rapid and significant obsolescence of existing occupations, and many are causing them to disappear altogether. At the same time, the rapid replacement of labor by technology has already brought the problem of unemployment to the agenda. Even if the robots push people out of their jobs, who will buy the goods and services produced and with what money is also discussed. Because robots and machines neither receive wages nor consume manufactured goods and services.

However, it should be taken into account that this revolution also creates new professions and requires personnel training for these professions. For example, one study suggests that up to 150 new types of occupations have emerged. Smart home design manager, science ethicist, technology advocate, digital marketing manager, vertical agriculture consultant, drone standards specialist, digital tailor, artificial intelligence technician, 3D printing technician, and more. It is possible to give examples of new professions. Therefore, high flexibility is required from educational systems and vocational training networks in this period, so that they can quickly adapt to the demands of the labor market. At the same time, it is necessary to take into account that the approach to education is also radically changing, as existing professions are rapidly

becoming obsolete. The concept of lifelong learning has literally entered our lives. This makes the rapid spread of distance forms of education inevitable (World Economic Forum).

The current pandemic has also changed the concept of the workplace, which has been discussed for a long time. It is true that digital technologies allowed remote work (tele-work) until the pandemic. However, this pandemic has already proven the possibility of mass work from home. This is a very big innovation and can have a very serious impact on the increase of labor market inclusion in the coming years [5].

Basic principles of the fourth industrial revolution

While embracing the 4th Industry in one operation may seem like a daunting task for some manufacturers, there are 4 key benefits that should convince leaders to begin the transition. Let's consider the 4 operating principles of Industry 4.0 technology and note their advantages.

Interoperability

This first principle is reciprocity. It is the ability of machines, devices, sensors and people to connect and communicate with each other through the Internet of Things (IoT) and then use that information to act and make improvements. Bringing tools, sensors, machines and workers together, i.e. ensuring integration. By doing so, businesses gain broad visibility into operations and access to deep and accurate information. The next step in interoperability is to integrate this data with an LMS(Learning Management System), MES (Manufacturing Execution System), ERP(Enterprise Resource Planning) or other smart factory systems and analyze the data at real time. This creates a network of interconnected data points that can be accessed from anywhere at any time. This principle is formed on technology's ability to provide improved information for future decision-making. The interoperability of Industry 4.0 not only gives manufacturers access to vast amounts of data and precise operational knowledge, but also enables them to complete processes at high speeds.

Information Transparency

In this context, transparency is used to describe how easy it is to observe the actions taken and data stored in a business. With considering this, Information Transparency is a key principle of

Industry 4.0, as information is perfectly processed and easy to access. In short, mastering this feature helps an entrepreneur keep track of all the processes taking place in the business and allows them to flexibly adjust and optimize the error for greater efficiency. The more data is collected, the more transparency is gained in the operation, and the opportunities to make effective and long-term improvements expand.

Technical assistance

First, technical assistance is the ability of cyber-physical systems to support people by gathering and visualizing information in an understandable way to make informed decisions and solve urgent problems in a short period of time.

Second, technical assistance is also the ability of cyber-physical systems to physically support people by performing a series of tasks that are unpleasant, too tiring, or dangerous for workers. Now, the number of accidents caused by robots in factories to perform dangerous operations that used to be done by humans in the past has been greatly reduced. Technical assistance helps manufacturers understand their data in faster and more powerful ways, while also handling more difficult and dangerous tasks on the shop floor.

Decentralization of decisions

Decentralization of decisions comes from the ability of cyber-physical systems to make choices independently of humans. Rather than requiring workers to carefully monitor variances or monitor material needs, a cyber-physical system can manage these issues autonomously through a decentralized network of IoT and cloud computing. Naturally, this leads to machines and systems that can act and perform their tasks without any human intervention, making factors such as problem solving, calibration, regulation and notifications a fast and autonomous system. Only in the case of exceptions, interference or conflicting objectives are duties assigned to a higher level. A decentralized system is also highly adaptable and scalable, which shows how effectively an enterprise can respond to industry changes.

Conclusion

As with all other revolutions, the Fourth Industrial Revolution is creating radical changes in the manufacturing industry and bringing a number of benefits to those willing to face the challenges and take advantage of the new opportunities. This industry exists by providing producers with a large amount of knowledge. We must see the obstacles created by the new revolution as opportunities and properly use the basic principles of Industry 4.0 to move towards the distant future.

Through these crucial changes underway today, we have the opportunities to actively form the Fourth Industrial Revolution to be both inclusive, human -centered as well. This revolution has a deeper meaning than technology - it is an opportunity to unite international communities, build a sustainable economy, adapt and modernize governance models, reduce material and social inequalities, and realize the transformation of emerging technologies into values-based leadership.

Undoubtedly, we are moving towards a society dominated by knowledge and technologies. We are moving towards a society where people move away from physical, repetitive tasks in both work and home life towards creative work. This means a society with a higher productivity economy. However, it should be taken into account that if this revolution and its achievements remain the monopoly of the existing developed countries, as in the previous industrial revolutions, this time we may face the deepening of income inequality in the world economy. Because these technologies we are talking about will already begin to take away the ability of many developing countries to compete with cheap labor. As physical labor in manufacturing is replaced by technology, competitive opportunities based on cheap labor also disappear. For example, brands such as "Nike", "Adidas", "Reebok", which will expand

their production with three-dimensional printing in the coming years, may not be interested in production in countries such as Vietnam, Bangladesh, and Indonesia with cheap labor. Much can be said about changes that will lead to radical results like this. However, the important conclusion is that staying away from these technological innovations does not promise a good future for the countries.

References

1. Алесинская Т.В. Основы логистики. Функциональные области логистического управления, 2010.
2. Nurəliyeva R.N., Azərbaycanın yanacaq-enerji kom-pleksinin inkişafının iqtisadi - ekoloji problemləri., Monoqrafiya, Azər nəşr, M-651(07) qıfıflı nəşr, Bakı 2010.
3. Щербачков В.В. Основы логистики: учебник для вузов, 2009.
4. Афанасенко И.Д., Борисова В.В. Экономическая логистика: учебник для вузов, 2013.
5. Григорьев М. Н., Уваров С.А. Логистика, 2011.
6. Saban, A.K.; Mawhinney, Müştəri yönümlü global tədarük zəncirləri: effektiv idarəetmə anlayışları. Hershey, Pensilvaniya: Məlumat Elminə İstinad. s. 208-223, 2012.
7. Liu C. International Competitiveness and the fourth industrial revolution // Entrepreneurial business and economics review, volume 5 issue 4, pp.111-133, 2017.
8. World Economic Forum 91-93 route de la Capite CH-1223 Cologny/Geneva Switzerland Erik Brynjolfsson and Andrew McAfee, The Second Machine Age: Work, Progress, and Prosperity in a Time of Brilliant Technologies, W.W. Norton & Company, 2014

Ляман Сифадə НОВРУЗОВА

Азербайджанский Государственный Экономический Университет
Факультет экономики и менеджмента
E-mail: lamannovruzlu9@gmail.com

Резюме

В настоящее время человечество живет в период больших перемен, когда стремительно развиваются масштабные, сложные и удивительные технологические инновации, искусственный интеллект входит в различные сферы нашей жизни. Уже миновав три промышленные революции, включая изобретение парового двигателя, электричества, компьютера и Интернета, мы с конца 20-го века стали свидетелями новых технологических прорывов, таких как искусственный интеллект, роботы, Интернет вещей, автономные машины, трехмерные принтеры, нанотехнологии, биотехнологии и квантовые вычисления. Мы живем в эпоху четвертой промышленной революции. Вопросы о том, что эта революция сулит людям, компаниям, странам и миру в целом, и как использовать созданные ею возможности, в настоящее время являются предметом широких интеллектуальных дискуссий.

Ключевые слова: *устойчивое экономическое развитие, четвертая промышленная революция, информационные технологии, робототехника, Интернет.*

Ləman Sifadə NOVRUZLU

Azərbaycan Dövlət İqtisad Universiteti
İqtisadiyyat və İdarəetmə Fakültəsi
E-mail: lamannovruzlu9@gmail.com

AZƏRBAYCANDA DÖRDÜNCÜ SƏNAYE İNQİLABI

Xülasə

Hazırda bəşəriyyət irimiqyaslı, mürəkkəb və heyrətamiz texnoloji innovasiyaların sürətlə inkişaf etdiyi, süni intellektin həyatımızın müxtəlif sferalarına daxil olduğu böyük bir dəyişikliklər dövründə yaşayır. Biz, artıq özündə buxar mühərriki, elektrik enerjisi, kompüter və internetin ixtirasını ehtiva edən üç sənaye inqilabını geridə qoyaraq, XX əsrin sonlarından etibarən süni intellekt, robotlar, əşyaların interneti, avtonom maşınlar, üçölçülü printerlər, nanotexnologiya, biotexnologiya və kvant hesablamaları kimi yeni texnoloji sıçrayışlara əsaslanan dördüncü sənaye inqilabı dövründəyik. Bu inqilabın insanlara, şirkətlərə, ölkələrə və bütövlükdə dünyaya nələr vəd etməsi, onun yaratdığı imkanlardan necə istifadə olunması barədə suallar hazırda geniş intellektual müzakirələrin mövzudur.

Açar sözlər: *dayanıqlı iqtisadi inkişafı, dördüncü sənaye inqilabı, informasiya texnologiyaları, robototexnika, internet.*

Daxil olub: 10.02.2023