ТАНСФОРМАЦІЯ УРЕЧЕВЛЕННОЇ ПРАЦІ ПІД ВІПЛИВОМ ЦИФРОВІЗАЦІЇ: ОЗОНИ ТА ОСОБЛІВОСТІ

Актуальність. Студійні і швидкість проникнення цифрових технологій в економіку, суспільство або сферу міжсуб'єктивної взаимодії вражають. Різні дані демонструють значний спліт охоплення населення по всьому світу, проте підкреслюють нерівномірність розбудови цифрової інфраструктури та, відповідно, різні темп розвитку цифрової економіки країн. Тому зростання компаній Google, Apple, Facebook та Amazon вражають, тому що їх сумірний капітал нині все перевищує ВВП деяких країн Європейського союзу, таких як, наприклад, Іспанія. Тому країни світу починають замислюватися, як будувати відносини з такими компаніями, що стають потужнішими гравцями на світовій арені. Виникнення таких умов у світовій економіці свідчить про формування третьої хвилі глобалізації — цифрової, коли найнайбільш багатий бізнес визначає умови світового розвитку. Тому прогресивне відновлення та розвиток виробничого потенціалу потребують постійного дослідження питань змісту і сукупності виробничих відносин, які формуються на сучасному історичному етапі.

Мета та завдання. Проаналізувати ознаки та особливості трансформації уречевленої праці під впливом цифровізації та розглянути формування цифрових засобів виробництва.

Матеріали та методи. Результати аналізу і теоретичного узагальнення розробко, наукових підходів до трансформації уречевленої праці під впливом цифровізації, що висвітлені в публікаціях фундаментального, аналітичного та практичного характеру, а також офіційні статистичні дані, аналітичні матеріали Кабінету міністрів України, Центру економічного розвитку, звіти McKinsey & Company, UNIDO та Robo Advisor Statistics формують матеріальну та методичну базу дослідження. Дослідження ознак та особливостей трансформації уречевленої праці під впливом цифровізації здійснено з використанням методів наукового абстрагування та аналізу.

Результати. На основі використання методу наукової абстракції (діалектичного матеріалізму) виокремлено три рівня класифікації ознак та особливостей трансформації уречевленої праці під впливом цифровізації, а саме: специфічний, загальний та всезагальний, що дозволило проаналізувати їх компетенційний потенціал в умовах цифровізації економіки. Аналіз розвитку цифрових продуктивних сил як матеріальної основи виникнення нової економічної системи доводить, що вони забезпечують динамічне зростання економіки, розвиток бізнес середовища та підприємницької діяльності, підвищення темпів розвитку цифрової, коли малий та середній бізнес визначає умови світового розвитку, формуючи нові соціально-економічні відносини, що стають потужнішими гравцями на світовій арені. Результати дослідження відносяться до третьої фази трансформації уречевленої праці, що відбувається в умовах цифрового розвитку, а також відносяться до третьої хвилі глобалізації. Зміни у загальній структурі виробництва та у соціально-економічних відносинах показують, що вартість робочої сили перестає відігравати ключову роль у процесі формування виробничих витрат, а основним фактором соціально-економічних змін втратять своє значення. Темпи розвитку цифрової економіки в Україні, наприклад, вже перевищують темпи розвитку економіки інших країн, що свідчить про прогресивне відновлення і розвиток виробничого потенціалу країни.

Висновки. Цифровізація економіки супроводжується як зміною природи виробничих або економічних відносин, так і зміною безпосередньо виробничих сил та факторів виробництва виникнення нової економічної системи, що вони забезпечують динамічне зростання економіки, розвиток бізнес середовища та підприємницької діяльності, підвищення темпів розвитку цифрової, коли малий та середній бізнес визначає умови світового розвитку, формуючи нові соціально-економічні відносини, що стають потужнішими гравцями на світовій арені. Результати дослідження відносяться до третьої хвилі глобалізації. Зміни у загальній структурі виробництва та у соціально-економічних відносинах змінюють структуру суспільного відтворення, збільшуючи простір і межі економіки.

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The digitization of the economy is accompanied by a change in the nature of production or economic relations, as well as a change in production forces and factors of production as a result of the implementation of breakthrough technologies, robotization, and the creation of cyber-physical structures. Digital technologies provide an opportunity to effectively develop business, become the basis of productive and production strategies, change traditional business models, and cause the emergence of new products and innovations. It is predicted that by 2030, more than 60% of professions will be automated, and plants and factories will be able to improve and modernize independently, that is, with no or minimal human involvement. Business processes, logistics, production cycles will be constantly optimized offline. Under these circumstances, the cost of labor ceases to play a key role in the process of formation of production costs, and the technological potential of the national economy becomes the main factor of economic development.

**Conclusion.** The digitalization of the economy is accompanied by a change in the nature of production or economic relations, as well as a change in production forces and factors of production as a result of the implementation of breakthrough technologies, robotization, and the creation of cyber-physical structures. Digital technologies provide an opportunity to effectively develop business, become the basis of productive and production strategies, change traditional business models, and cause the emergence of new products and innovations. It is predicted that by 2030, more than 60% of professions will be automated, and plants and factories will be able to improve and modernize independently, that is, with no or minimal human involvement. Business processes, logistics, production cycles will be constantly optimized offline. Under these circumstances, the cost of labor ceases to play a key role in the process of formation of production costs, and the technological potential of the national economy becomes the main factor of economic development.

**Key words:** transformation, digitalization, signs of transformation, features of digitalization.
socio-economic development. Digitization and new technologies affect the conditions of competition in the world. As artificial intelligence and robots are involved in production processes and the service sector, the cost of labor becomes a less important factor in determining the country's competitiveness, while technological competence and the quality of infrastructure, on the contrary, become more important. Such technologies as Big data and the Internet of Things help to optimize production processes and reduce operational costs, develop new products and services. A new stage of automation of machines capable of learning and improving in the process of production activity is beginning. If so far automation has displaced people from the sphere of routine physical work, now progress in the field of machine learning and artificial intelligence will allow to start a large-scale displacement of people already from the sphere of mental work, replacing representatives of routine intellectual work.

**Keywords:** transformation, objectified labor, digitalization, digital capital goods, signs and features.

**Problem statement and its connection with important scientific and practical tasks.** The rapid development of digital technologies characterizes the onset of a new stage of the industrial revolution, which changes the meaning of work and human life. The large-scale implementation of such technologies creates favorable conditions for the general automation and robotization processes of production. It is quite natural to expect fundamental changes in the economy from the coming digital revolution, because the emergence of electronic productive forces will inevitably change the nature and content of social industrial relations.


**Allocation of previously unsolved parts of the general problem.** Along with sufficient work on this topic of research, the problem of visioning the directions of the development of digitalization and its impact on the transformation of elements of social production – embodied labor – remains insufficiently developed.

**Formulation of research objectives (problem statement).** To analyze the signs and features of the transformation of embodied labor under the influence of digitalization and to consider the formation of digital means of production.

**Materials and Methods.** The results of the analysis and theoretical generalization of developments, scientific approaches to the transformation of embodied labor under the influence of digitalization, which are covered in publications of a fundamental, analytical and practical nature, as well as official statistical data, analytical materials of the Cabinet of Ministers of Ukraine, the Center for Economic Development, McKinsey&Company, UNIDO and Robo reports Advisor Statistics form the material and methodical basis of research. The study of the signs and features of the transformation of embodied labor under the influence of digitalization was carried out using the methods of scientific abstraction and analysis.

**An outline of the main results and their justification.** Based on the analysis of the process of dialectical interaction of living and objectified labor at various stages of the evolution of the technological method of production, the following patterns can be identified:

- at the first stage of evolution, under the conditions of a technological method of production based on manual labor, living labor dominated, the share of which absolutely prevailed both in a separate product and in the total mass of products, therefore, in pre-capitalist formations, the consumption of muscle energy reached 90%, with sufficient low technical capital structure;

- in the conditions of a technological method of production based on machine and automated labor, the share of living labor is constantly decreasing, which is reflected in the growth of the technical structure of capital, as well as in the corresponding changes of living and objectified labor in a unit of goods. The share of intellectual work in developed countries now reaches 80%. At the same time, the increase in objectified labor is accompanied by a decrease in the total amount of labor embodied in goods, which is a sign of increased labor productivity.

Therefore, objectified labor or past labor is labor spent on the production of a product and embodied in its specific material form. The two components of objectified labor are the value of the means of production transferred by concrete labor and the living labor embodied in the product,
spent on its production, i.e. newly created value. If the labor objectified in the product takes the form of the value of the product, then it is the carrier of production relations, which are also objectified.

Objectified labor does not create new value, but only serves as a condition for its creation. The value of the means of production consumed in the labor process is transferred to the new product by living labor. The cost of labor items is transferred in full, means of labor – in parts, as they wear out. With the development of productive forces, the deployment of scientific and technical progress, the share of living labor in products decreases, and the share of objectified labor increases.

Based on the use of the method of scientific abstraction (dialectical materialism), three levels of classification of signs and features of the transformation of objectified labor under the influence of digitalization are distinguished, namely:

1. Specific, which has the following characteristics:
   1.1. Increasing the technical capital structure. The formation of the digital economy is a transition from one techno-socio-economic structure to another. The mechanism of such a transition is based on the contradictory interaction of technological, economic and social relations in the production process. Technological relations are the most dynamic; they change along with technological progress. Economic relations change less dynamically, therefore contradictions accumulate over time, which are resolved in the process of reforms or revolutions. Social relations grow out of economic relations, but acquiring independent forms actively influence both economic and technological relations. At the current stage of the formation of the information and network economy, the interaction of technological, economic and social relations is manifested in the form of the interconnection of digitization, capitalization and socialization.

   Digitalization of the economy is the process of introducing digital technologies into social production, capitalization means the transformation of any resources into value capable of producing new value, and socialization of the economy means the direction of economic processes to improve operating conditions and human development. A key process in this is digital capitalization, i.e. investing in digital technology for profit.

   One of the most significant trends, the scale of which is hard to imagine now, is the development of cognitive technologies. Thanks to cognitive technologies, there will be a significant reduction in labor costs for routine office work: processing of standard documents, including certificates, applications, statements, reports, payment documents, declarations, contracts, etc. In this way, the main part of the document flow and almost any work related to information processing will be fully automated.

   Compliance with the principle of technological determinism in economic practice leads to two most important consequences. First, it is the action of the tendency to increase the technical structure of capital, which is manifested in the growing technological efficiency of production. Moreover, in crisis periods, which regularly occur, the removal of obsolete capital and its renewal on a new technological basis are a tried and tested method of overcoming the crisis phase of the industrial cycle. That is why with each subsequent stage the world becomes technological, and this process continues, covering more and more new spheres of human activity on the way to an industrial-digital society. Secondly, it is the approval of an innovative model of economic development for the entire market economy. It is with high innovative activity that the possibility of ensuring the appropriate level of competitiveness is now associated, because thanks to it, companies get the opportunity to maintain and even strengthen their positions in the market, while receiving high profits. Innovation serves as a way to increase profits with capital. For this, new products are needed, as well as demand, which is created through its purposeful formation (Ukrainian, L., & Marchenko, O., 2020).

   The following circumstances contributed to the growth of the relative importance of digital technologies:

   1. Extremely rapid growth in the performance of the physical devices used in computers. According to the so-called Moore's law, based on empirical observations, the number of transistors placed on an integrated circuit crystal doubles every two years, while their cost remains approximately the same.

   2. Very rapid progress of digital technologies based on recording information in binary code. Digital technologies make it possible to compress large volumes of information and store them on small storage devices that can be easily stored and transported, and dramatically increase the speed of data transfer. This led to an explosive growth in the volume of digital information accumulation, which was less than analog information even in 2000. Now the amount of digital information in the world is growing exponentially.

   3. Anticipatory pace of development of the
Internet – a global system of interconnected computer networks that uses a special set of data transfer protocols in digital form. The Internet revolutionized the fields of communications, production, trade, education, science, culture, etc.

4. Acceleration of production robotization. Robotics is the automation of physical processes using automatically controlled, reprogrammed multi-purpose manipulators and special control systems. A vivid example of this is modern car factories that have achieved a high level of autonomy. Typically, robots are used in industry to perform monotonous and labor-intensive operations to save time and allow people to focus on higher priority and creative tasks. However, intelligent robotics is already developing, which allows automating complex business processes with the help of artificial intelligence. In this case, robot actions can be based on judgments using, in particular, unstructured and non-digital data sources. We are talking about so-called collaborative robots (or cobots), designed specifically for cooperation with people in a shared workspace (Fig. 1) (Vishnevsky, V., 2022).

![Fig. 1 Expected volumes of the world market of industrial robotics in 2019-2027, billion dollars. Source: Compiled by the authors based on (Vishnevsky, V., 2022).](image)

Large-scale digitalization, computerization, and robotization of all spheres of economic and social life in the coming decades will certainly accelerate the process of further automation of production and technological replacement of labor by capital. In fact, a new stage of automation of machines capable of learning and improving in the process of production activity is beginning. If so far automation has displaced people from the sphere of routine physical work, now progress in the field of machine learning and artificial intelligence will allow beginning the large-scale displacement of people already from the sphere of intellectual work, replacing representatives of routine intellectual work, that is, mostly representatives of the middle class.

1.2. Automation and robotization of production, the emergence of electronic productive forces. The externalization of intelligent human functions is connected with the creation of artificial intelligence, which is understood as "the property of intellectual systems to perform creative functions that are traditionally considered a human prerogative." During the last 30 years, the participation of people in production has decreased from 64% to 59% worldwide (Andryushchenko, K., Shergina, L., & Kovtun, V., 2022). Therefore, according to experts' forecasts, by 2040, the automation of industry will lead to a reduction of jobs by approximately 40%, primarily due to low-paid positions in production (Deeva, N., & Deleichuk, V., 2018). Thus, the digitalization of the economy can leave millions of people in the world without work. It is predicted that by 2030, more than 60% of professions will be automated. In the future, plants and factories will be able to improve and modernize independently, that is, without or with minimal human involvement. Business processes, logistics, production cycles will be constantly optimized off-line. Predictive analytics will play a significant role in this process, namely: based on the analysis of large volumes of data, it will be possible to predict the probability of failure of a system element or an entire device, and replace the component even before it completely fails. An example of such a smart factory already exists – this is Siemens Electronic Works in Amber (Germany), where human participation is minimized, since the "smart system" implemented in production independently monitors the operation of its 1.6 billion components, sets production standards and controls logistic flows (Grazhevska N., & Chygyrinsky A., 2021). Under these circumstances, the cost of labor ceases to play a key role in the process of formation of production costs, and the technological potential of the national economy becomes the main factor of socio-economic development.
The output of formal thinking directly to the use of things in the digital world forms such a reality as the Internet of Things, which is a global network of "physical devices connected to the Internet – "things" equipped with sensors, sensors and information transmission devices. These devices are united by connecting to control, management and information processing centers (Hrytsenko, A., 2018).

The development of all these technologies relies on Big Data. According to companies' forecasts, the use of Big Data will increase in many sectors of the economy, in particular in transportation and logistics, trade, telecommunications, financial companies, and industries with the development trend of "Industry 4.0" (emergence of cyber-physical systems): IT – 23%, trade – 22%, consulting – 19%, finance – 12%, construction – 7%, auto – 5%, logistics – 4%, pharmaceutical industry – 4%, other – 4% (Pizhuk, O., 2019).

The emergence of new approaches to information processing, in this case, the spread of the concept of big data and the use of modern digital technologies led to the formation of a global electronic environment, opened up new approaches to the organization and conduct of business, opened up new opportunities in various spheres of socio-economic activity. The use of big data is not only a tool for optimal planning and informing – it is a way to shape a new future.

According to the McKinsey Global Institute's estimates, "between 400 and 800 million people could be made redundant by automation and will require new jobs by 2030 worldwide" (Vectors of economic development 2030, 2020). It is predicted that in 2030, 8 to 9% of new occupations will be in demand that do not yet exist, 5% of occupations will disappear as a result of their complete automation, and 60% of occupations will possibly be automated by 30%, threatening a corresponding reduction in the workforce. According to a study by the European Commission, about 50% of current jobs worldwide can theoretically be automated, and in the EU, 37 to 69% of jobs may be partially automated in the future. Already today, about 14% of jobs in OECD countries are automated, and another 32% of jobs will require changes (European Commission, 2021).

1.3. A system of interconnected four-line machines and digital means of production. After the First Industrial Revolution and the transition to the industrial stage of technology development (the first half of the 18th century – the first quarter of the 19th century), the productive forces were constantly improved in the process of extended reproduction, while changing several technological systems within the limits of the market capitalist economy. The change in technological systems ensured the growth of labor productivity. Industrial equipment, regardless of technical diversity and performance of various functions, has a certain unity. All these technical means contain three links – the engine, the transmission mechanism and the working part. The industrial three-link system of machines in all branches of the economy performs one function: it expands the natural limits of human capabilities. However, industrial technology has a limit to its development. The essence of this limit lies in the natural capabilities of a person, who is an organic part of the production process (Zyablyuk, R., 2020). This limit, in turn, sets the limits of economic relations based on it. As a result, the space for effective use of market laws of the economy is reduced. In order to overcome the limits of the development of industrial technology and continue technical, as well as socio-economic progress, it is necessary to replace human functions in the production process. This is evidenced by the history of technical revolutions under capitalism.

In the new historical era, computing technology and mathematical programming turned out to be such. The result was the emergence of a new industry in the industry – electronics, which acted as a means of overcoming the limits of the development of industrial technology and its fourth controlling element. This new element radically changed the technical basis of the economy. Thus, the new fourth element, which arose from previous technical development, preserves the achievements of technical progress in a transformed form, becomes an integral part of industrial technology and removes obstacles to its development. The fourth link of new technology replaces limited human functions, performing them instead of the worker.

As a result of the transformation of a three-link system of machines into a four-link, a technique consisting of an engine, a transmission mechanism, a working part and a control and control device emerged. In other words, electronics have turned the three-link system of machines into a system of automatic lines, that is, industrial robots. Therefore, the essence of modern scientific and technical progress is a system of interconnected four-link machines (Zveryakov, М., 2020). Different types of these machines – automatic machines, industrial robots, artificial intelligence – mean a revolutionary revolution in tools of labor. These types of machines, releasing a person from the direct production process, multiply the
functioning of the equipment itself, increase its efficiency. As a result, there is a sharp increase in labor productivity. The fourth link fundamentally affects the previous three. New materials, energy resources, nano and biotechnologies appear and are introduced into production. The change in the objects of work and technologies has an adverse effect on the development of tools. Thus, with the appearance of four-link technology, historically new material elements of productive forces are formed – digital means of production.

Digital technology, forming new productive forces, radically changes socio-economic relations between people. The periods of formation of new productive forces and socio-economic relations do not coincide. New technology emerges spontaneously at various points in the economic space. New relations between people are formed because of the development of internal contradictions within the previous form of economy. During the genesis of the economic system, there was no synchronicity between the episodic spread of new technology and new socio-economic relations. Digital productive forces are the material basis for the emergence of a new economic system. Some of its contours can be observed at the stage of formation. True, in reality they are not present in a mature form, but in certain transitional economic forms that combine economic relations that are receding and those that are just being formed.

2. General, which has the following characteristics:

2.1. The existence of cyber-physical production systems. The basis of these radical transformations is the deployment of Industry 4.0, the essence of which is that interconnected smart devices, sensors and sensors without direct human involvement are connected to Internet platforms that analyze information coming from the outside. The results of such an analysis become the basis for further planning and functioning of individual elements and systems of which they are a part.

Big data is now often called the "new oil", the informational equivalent of a natural resource that shaped the economy of the 19th and 20th centuries. Nevertheless, unlike oil, big data is available in almost unlimited quantities, and besides, it is "renewable". At the same time, data analysis can be compared with its extraction and transportation. Big data analytics has the potential to transform the value and efficiency of new product development, market targeting, and pricing processes. Big data analytics has become widespread and today accounts for more than 50% of all business software. Humanity generates 2.5 billion gigabytes of data every day. By 2003, the world accumulated 5 exabytes of data, in 2008 this amount increased to 0.18 zettabytes, in 2011 to 1.76 zettabytes, and in May 2018, the amount of global data exceeded 16.5 zettabytes. In 2020, humanity generated 40-44 zettabytes of information, and by 2025 this number will increase 10 times. The key to the continued growth of the volume of data over the next 10 years is the so-called "Internet of Things" (Fig. 2) (Vishnevskyi, V. et. al., 2021).

![Fig. 2 Forecast of the development of the Big Data market, billion dollars.](image)

Source: Compiled by the authors based on (Vishnevskyi, V. et. al., 2021).

Increasingly, big data is becoming a commercial and strategic planning tool. At manufacturing enterprises, big data is generated because of the introduction of technologies, namely the Industrial Internet of Things. During this process, the main components and parts of machines and machines are equipped with sensors, actuators, controllers and, sometimes, inexpensive processors capable of performing extreme calculations. In the course of the production process, data is constantly collected and pre-processed; the results are stored in the most
convenient form for perception and are ready for further use. Based on the analysis of the received data, conclusions are made about the condition of the equipment, the effectiveness of the changes made to the technological processes, etc. Thanks to real-time monitoring of information, the company's personnel can – reduce the number of downtimes, increase equipment productivity, reduce equipment operation costs, and prevent accidents. In addition, based on the results of big data analysis, it is possible to calculate the payback period for equipment, the prospects for changes in technological regimes, the reduction of service personnel – that is, to make strategic decisions regarding the further development of the enterprise.

According to the estimates of McKinsey and Accenture analysts, only the Internet of Things will annually bring from 4 to 11 trillion dollars to the world economy by 2025, industrial Internet of things – 14 trillion dollars by 2030. According to PWC forecasts, artificial intelligence will increase global GDP in 2030 by 15.7 trillion dollars. Of them, 6.6 trillion dollars will be associated with an increase in labor productivity (McKinsey&Company, 2021).

Unlike the classic Internet, which provides communication links between people, the Internet of Things provides machine-to-machine communication in the M2M format between non-living things, as well as between the non-living and living worlds, between things and humans, informing the latter about what is happening, for example, in a room, apartment, house, factory, warehouse, open area and taking appropriate decisions from a person in the form of signals to correct the situation. The Internet of Things radically changes material production, the sphere of services, the relationship between the business community, the state and the population, creates the possibility of robotization of socio-economic processes based on the formation and development of cyber-physical and intelligent unmanned systems. The Internet of Things contributes to the creation of real objects (goods) with the help of robotic production. Virtual robots started a new direction – the robotic Internet of Things, that is, a computing network of physical objects with built-in technologies for interaction with each other in the format of transmitting and receiving specific information using sensors, barcodes, and QR codes. Such an exchange of information gave impetus to the development of machine-to-machine communication – M2M and various derivatives. In the end, automation of things takes place: "smart" heating plants regulate the temperature, supply water to batteries taking into account the temperature of the surrounding air, "smart" curtains regulate transparency taking into account the level of the outside world and the required lighting in the room.

The Internet of Things is one of the components of the infrastructure of "smart" industries, "smart" houses, and "smart" cities. The concept of "Smart City", "Safe City" or "Electronic City" is becoming more and more widespread in the world. Its main goal is to increase the efficiency of all city services using information and communication technologies, thereby expanding "bottlenecks" and eliminating redundancy in the generation and use of information. Now, more than 2,500 large and small cities of the world have adopted the concept of "Smart City" and implement Smart City projects in one or another volume, architecture or functionality of information systems of city services (Pucenteiio, P., Gumenyuk, O., 2018). Smart City is a deeply integrated system consisting of many subsystems, which include various functional components, each of which can be used simultaneously in many subsystems.

If robots do all routine work, people will be employed in sectors where higher benefit is created.

Digitization and new technologies will also affect the conditions of competition in the world. As artificial intelligence and robots are involved in production processes and the service sector, the cost of labor will become a less important factor in determining a country's competitiveness, while technological competence and the quality of infrastructure, on the contrary, will be more important.

Technologies such as Big Data and the Internet of Things will help to optimize production processes and reduce operational costs, develop new products and services. Virtual reality will be used to expand professional skills, artificial intelligence and robotics – to increase labor productivity.

As of January 2021, 4.66 billion people worldwide use the Internet, which is 316 million (7.3%) more than last year. Global Internet penetration is now 59.5%. Currently, there are 4.2 billion users of social networks in the world. This figure increased by 490 million over the past 12 months, representing year-on-year growth of more than 13%. The number of users of social networks is currently equivalent to more than 53% of the total population of the world. On average, more than 1.3 million new users joined social networks every day during 2020, which is equivalent to about 151/2 new users every second (Global

2.2. Transferring market relations to virtual space. The transformative processes turned out to be so dynamic, and their scale and results are so significant and innovative that today we can talk about the formation of the so-called new global dual real-virtual economic space. The virtual environment created thanks to the Internet has specific characteristics, including for conducting business: formation of new competitive business strategies, reorganization of forms of joint activity and transformation of traditional organizations and territories into more effective network structures; reducing the level of competition and risks, asymmetry of information; increasing the speed of constant global information exchange and making optimal management decisions. Within the framework of this specific reality, a global virtual market of goods, services and capital has been formed and is dynamically developing in the last decade. The term "virtual market" refers to an open system of regular, mostly monetary, mutually beneficial, voluntary exchange of goods with the help of a global information and communication network and other digital technologies under conditions of competition.

Consequently, the traditional and new virtual economy interpenetrate, as most of the participants in the interaction are represented and simultaneously conduct economic activity in both real and virtual spaces. Recently, the majority of large industrial enterprises have been operating in conditions of "flowing" of economic activity processes from the real market to the virtual one, and vice versa. In addition, on this basis, new specific market participants are formed and actively influence many processes – so-called "virtual enterprises", whose main activity takes place in a virtual environment.

The most adequate form of existence of the information environment is a network. Therefore, the economy, whose priority task is the production of information, the adequate environment of which is the network, can be characterized as an information-network system of management.

An essential feature of the classification, which distinguishes natural-economic, industrial-market and information-network systems, is that it is built based on the method of ascent from the abstract to the concrete, which is adequate for the knowledge of logical-historical development. Each historical stage does not disappear without a trace, but is removed, that is, it disappears as an independent one, but is preserved as a moment of the next stage of development. Yes, natural economic systems are replaced by historically industrial and market ones, but natural economic relations between producer and consumer do not disappear, they only become mediated commodity-money relations. The producer and the consumer, the production and consumption of the product, which is characteristic of natural-economic relations, have become only separate parts of the whole, which are connected by means of exchange and money.

The transition from industrial-market systems to information-network systems also does not destroy these relations, but transforms them into information-network ones. The production of industrial products and their market exchange also remain which means that natural-economic ties remain with them. Now market relations are transferred to virtual space. When, for example, a person worked and received a salary credited to an electronic bankcard, he actually gave the product of his labor, and received only a credit to his account, which is not a real benefit. No real exchange of equivalents took place. But then this person comes to the shopping center and buys the necessary goods, that is, he receives a real benefit, and pays with a bank card, that is, he leaves only an electronic record to the seller. Again, no real equivalent exchange takes place. Real commodity-money relations have disappeared, they have been transferred to virtual space (Pizhuk, O., 2020).

2.3. Digitalization and personalization of consumption. The expansion of digital technologies and their introduction into a person's everyday life will transform his inner and outer world, so he will start buying things that are more individual. This is facilitated by:

– individualization of production – manufactured products will meet the needs of each specific consumer;

– the communicative interaction of things (various technical devices, machines, equipment, sensors) within the Internet of Things becomes systemic and, therefore, more customized for a specific consumer;

– mass production becomes individualized;

– virtual augmented reality creates a selective individual world for each person, separating it from reality;

– a person's life, as well as his behavior, becomes more and more "digitized", analyzed, controlled, directed and regulated, and therefore, a person loses his individuality, identity;

– gradual alienation of the inner world from a person;

– expansion of the government's opportunities to segregate people, determine and shape their life paths, as well as the necessary workers;

– increasing polarization of human
communities.

The added value of digital products and services can only be attracted by using the latest smart technologies. This leads to the transformation of business models aimed at the individualization of the provided goods and services, as well as the emergence of the principle of "everything as a service". For example, the "car-sharing" service, Uber, etc.

All these processes are contradictory and generate a number of problems and challenges for society. Among them, we can single out the most general ones that are of fundamental importance:

1) digitalization, together with the creation of a new potential for technological development and an increase in labor productivity, significantly strengthens the network characteristics of the functioning of the economic system, contributing to the growth of opportunities for fragmentation, disintegration and disintegration of the economy, society and man, and thus forming challenges to the very existence of humanity;

2) the capitalization of digital technologies increases the unevenness of economic development, the financialization of economic processes, changes the nature of economic dynamics, in which the crisis turns into a discrete-permanent process, and economic fluctuations become parametrically uncertain in space and time;

3) digitization and capitalization in their unity lead to significant changes in the role of man in the production process, the content and character of his activity, the ratio of necessity and freedom in it, gives rise to a whole series of fundamentally new social problems.

The fourth industrial revolution plans to make automated equipment "talk to each other without human intervention." It is about the creation of global self-organized production systems, which are characterized by high flexibility and realize the synergistic potential of technological development. Productive forces will become self-organized, will be able to receive feedback from the final product, unit, machine, household appliance. The dynamics of the processes will grow especially powerfully and will be manifested in the stratification of the market and the formation of niche structures when the Internet of Things begins to be intensively used. Society is waiting for an "explosion", which, according to various estimates, will take place in the next 5-7 years. Technologies should become cheap and commercially viable. One of the key developments in the Internet of Things and the Fourth Industrial Revolution is that materials are able to identify themselves with their own labels, which is changing communication between things and the market as a whole. The communication process will transform and acquire new qualitative characteristics and participants; communication channels will become more complex, and the market in the digital economy will become more differentiated and niche. The main trend is personification and digitization.

New technologies are changing the way people live, providing a wider choice of digital goods and services, lower prices, more complete information, more distribution channels, facilitating the emergence of information-oriented transactions for consumers (e-commerce, online health care, distance education, online banking etc.). In the conditions of the information market, multidimensional qualitative transformations of consumption are carried out at all levels: new needs arise, the differentiation of benefits and methods of their satisfaction deepens, and the scope of demand expands.

Wide access to information today gives the consumer much more opportunities to improve the quality of demographically determined needs, their greater intelligence, which leads to a higher level of requirements for their satisfaction. The interpretation of utility is expanding, and alternative opportunities and goals are growing when making consumer choices. At the same time, simplifying the interaction of the consumer with the producer creates prerequisites for shifting the interests of the consumer from the long-term to the short-term. In the conditions of increasing the level of awareness of the consumer and reducing the asymmetry of information, the possibility of him making flexible and adequate decisions at the given moment is increasing, which must be taken into account when developing forecasts of consumer behavior. In addition, the influence of the consumer on the process of product formation increases, when modern information and communication technologies allow combining the satisfaction of individual needs with efficient production in the conditions of the global market. All this leads to the establishment of the era of the consumer in the market.

The transformation of consumption in the modern economy leads to a change in the technology of life organization, the economic field of consumer activity, significantly transforming the spatial and temporal coordinates of consumption. They are transformed under the combined influence of the information technology process and historical changes.

3. Universal, which has the following characteristics:

3.1. The emergence of universal property
instead of private and free labor instead of hired labor. The production of ordinary economic goods, their exchange based on market laws and the distribution of production results according to the value of resources are typical for the industrial market economy. This corresponds to the institutions of private ownership of the means of production, hired labor and distribution by value and capital (the hired worker receives the value of labor power in the form of wages, and the capitalist entrepreneur receives additional value in the form of profit on capital). The industrial market economy is the "production of goods by means of goods". A formed and sufficiently developed information-network economy will represent the production of information with the help of information, which will become the main product and the main resource of the functioning of the economy. That doesn't mean there won't be anything else. Everything will be, but the fundamental and main thing will be the production of information - a network good, which, unlike an ordinary one, can be owned by everyone and everyone at the same time and will be used by them. This corresponds not to private, but to universal property. Together with the formation of the information and network economy, the relations of universal property are gaining strength, which inevitably come into conflict with private property.

Wage labor is characteristic of an industrial market economy. Its essence is that the worker sells his labor power, which is disposed of by the resource owner in the production process. For the information and network economy, free labor is adequate, when the worker in the production process disposes of his own labor power and sells not it, but information as a product of his labor. This form of production organization does not require the concentration of workers in a factory or institution, they can be located at any point in the economic space and work for their employer-customer. In the industrial market economy, the legal form of the contract between the worker and the employer has as its economic meaning the connection of the worker with the means of production and the transfer of the disposal of the labor force to the capitalist. In the information and network economy, this form of contract has a different meaning - the production of a certain information product for a fee. However, if so, then the information product is sold for its full value and additional value does not arise. In turn, the manufacturer in order to create an information product must purchase the necessary means of production on the market, which are mostly also information, that is, he acts as the same customer on the market as the consumer of the results of his activity. This means that in the information and network economy, each participant of social production is in equal relations with another network participant, creates and sells the product of his labor at full cost.

Nevertheless, a person is an objective being who must consume food, dress, have housing, objects of general use, etc. She cannot eat information, wear it and live in it. Therefore, this part of the economy, which will occupy an insignificant place, is preserved. Market laws inherent in the industrial market economy will operate here, but in a modified informational and network form. Just as the transition from a natural-economic to an industrial-market system does not destroy the production, distribution, exchange and consumption of products, but transfers them to market foundations and gives them a market form, so does the transition from an industrial-market to an information-network system does not destroy value relations, but transfers them into virtual space and gives them a network character.

That is, the main content of the transformations of basic institutions in the process of historical transformation from industrial-market to information-network economy consists in the change of dominant institutions, which is embodied in the transition from: 1) private property to universal, 2) hired labor to free, 3) distribution by value and capital to equal distribution with basic and annuity-premium incomes (Hrytsenko, A., 2022).

3.2. Emergence of global production networks, disproportionality. The main resource and product of production is information, which has a network as its natural living environment, work is transformed into an activity for the reproduction and development of human abilities, and the product acquires characteristics of reciprocal good, an economic system is formed, which can be defined as informational and network. The dominant sphere of production in these conditions is the sphere of services. Thus, the social system in the process of historical development manifests itself in the three most general forms: natural-economic, industrial-market and information-network. However, another cannot understand the transition from one form to another as a simple replacement of one system. The previous form of connections does not disappear, but ceases to be dominant and turns into an element of implementation of a more complex form. Thus, natural-economic relations between people regarding the appropriation and use of labor
products in the process of forming an industrial-market economy do not disappear, but are mediated by commodity-money relations. In the next transition from the industrial-market to the information-network system of management, commodity-money relations also do not disappear, but are idealized and move into virtual space. For example, when using a payment card to make payments for goods and services, the real equivalence of the exchange is not achieved in each individual case (the buyer receives a real product for an electronic entry to the seller’s account). Equivalence is achieved only as a general result of a system of exchanges, and not in each individual act of exchange, as it was before. Commodity exchange turns into a system of conditional money exchanges. After all, the voluntary transfer of goods without an equivalent is a gift. The condition of this gift is that, in the end, the total value of the gifts given for a certain period will not exceed the value of the gifts received. Digitization creates its own technological basis for money exchange, replacing the movement of real symbolic forms (paper money and various payment documents) with electronic records.

All this requires the development of the infrastructure of the digital economy, which, first, should include various networks with their engineering support. The key components of the basic ICT infrastructure are: data transmission networks (local computing, territorially distributed, wireless networks, structured cable system); subsystem of engineering support (equipment of server rooms: racks, electrical wiring, means of cooling equipment, sources of uninterrupted power supply – everything that ensures reliable operation of network and other equipment). A special place in the infrastructure of the digital economy is occupied by platforms that connect producers and consumers. The platform of the "digital" economy is a digital environment (software and hardware complex) with a set of functions and services, which provides the needs of consumers and producers, as well as realizes the possibilities of direct interaction between them.

All these technologies are directed to different spheres of activity, because of which the most important areas of development of the digital economy are formed. Among them are e-governance, virtual money and finance, industry 4.0, Internet trade, in general – the use of digital technologies in all types of economic activity.

The economic nature of "periphery capitalism" consists in the free transfer to highly developed countries of a significant part of the value created by the labor of peripheral workers. Through the output price mechanism, value created in low-capital industries is appropriated by high-capital industries. Some scientists call the income received by the metropolises from peripheral countries "imperialist rent". It was thanks to the import of cheap goods from peripheral countries that in the 2000s it was possible to reduce inflation in metropolitan countries. This fact indicates that the prices of goods supplied to the countries of the capitalist center from the peripheral countries were lower than their value. Currently, the relations of domination and subordination that have developed between the center and the periphery are clearly manifested in such an economic phenomenon as global production networks, which are based on global chains of added value. In economic practice, this manifests itself in the form of the division of TNC production activities into links of different technological levels and with different amounts of added value. In developed countries, TNCs concentrate knowledge-intensive types of production with high added value, while labor-intensive operations (own production) are transferred to countries with low wages. Under such economic conditions, the distribution of digital technologies beyond the borders of TNCs is limited, first, by patent rights. Modern TNCs use the cheap labor force of the periphery, thereby reducing the cost of the final product. Such actions of TNCs ultimately lead to the fall of capital-empowerment of labor in the world capitalist system. According to expert estimates, it has decreased by 55-60% over the past 20 years (Zverakov, M., 2020). This explains the reasons for the decline in the global rate of growth of labor productivity. In the countries of "peripheral capitalism", which are characterized by the free transfer of part of the income to the countries of the capitalist center, the spread of digital technologies is possible with the growing demand of national business for investment projects that will be able to bring income based on the growth of labor productivity. Therefore, as long as business focuses on obtaining short-term rental income, as it happens now, it will continue to have a low level of use of digital innovations and deindustrialization of production. However, the desire for a continuous process of renewal of production due to innovations is immanent for the development of capitalism.

Therefore, the formation of digital platforms of a global nature is taking place, which increasingly monopolize the modern information space, using it both for enrichment and for political purposes. Access to these technologies and corresponding platforms is far from equal. Platform companies
are “...kind of natural monopolies, when the winner takes all... In addition, they have captured the world market, which creates obvious imbalances in the world economy and trade. The tensions in the global economy caused by platform companies will continue to cause conflicts between national antitrust authorities and platform companies, as well as between those countries where the platform companies are based and the rest” (Heyets, V., 2022). In turn, this deepens and threatens to deepen inequality at both global and national levels. Unevenness, disproportionality in development between countries in the conditions of global platformization was exacerbated by migration with all its challenges and risks for both donor countries and recipient countries of migration flows. The high-tech sector, which is developing and has a relatively high level of wages, creates jobs for a clearly smaller part of the able-bodied. The majority of workers lose their jobs, especially in those sectors where mass robotization is taking place, and may be employed in activities with lower productivity, including those that retain traditional technologies that cannot and inefficiently be robotized.

The technologies of collecting, processing and storing information necessary for decision-making by the ruling class in the conditions of "postmodern" society are fundamentally reformatted and implemented by platform technologies and technologies of artificial intelligence. They "received a noticeable impetus for accelerated growth, require ... for the further development of a constant influx and generation of a huge amount of data. This inevitably leads to the monopolization of markets" (Granychev, N., & Koshovets, O., 2021). Developing new digital services and creating new digital markets is possible and necessary only on a global scale. All this will strengthen the processes of monopolization up to the global level and the formation of a global digital platform, which, in turn, will globally reorient society in the direction of a "new technological center" and a "new technological periphery", where the first and key role will be played by Chinese companies alongside American companies – developers of artificial intelligence technologies.

Digitization creates digital rent, deepening inequality and socializing the problem of poverty, because of the processing of large amounts of data, those in whose interests they are processed win in advance, and the interests of those who lose are neglected. Digital annuity is nothing but an annuity that allows you to receive income due to the position you occupy in the digital space.

The combination of planned capitalism and market socialism in one socio-economic system becomes the basis for the transition to a new level of development – to the information and network economy, which also has its own internal stages of development. Separation of information about the object from the object itself creates the possibility of its transfer and reproduction of the image of the object in an ideal or virtual form in another space. Initially, the recording and transmission of information takes place with the help of analog technologies that transmit information in the form of a continuous physical quantity (ordinary tape recorder, gramophone records, analog television, etc.). Radio broadcasting, television and related technical achievements arise based on analog technologies. At this stage, information-network systems exist as information-analog systems.

Further technical and technological progress creates an opportunity for the transition to digital technologies, which are based on a discrete way of transmitting information using a digital code. These technologies have significant advantages compared to analog in terms of qualitative and quantitative characteristics. Therefore, "new information technologies are digital. These include, for example, archiving and compression of information, scanning and recognition of texts, digital radio and television, digital photography, digital video recording, global information network Internet and e-mail, virtual reality" (Tarasevich, V., 2022). At this stage, information and network systems take the form of information and digital systems. Today, humanity is at this very stage of the development of information and network systems and the information and network economy. The most developed form of information network systems are neural network systems, which arise on the basis of mathematical modeling of the work of nervous activity and the human brain and open the prospect of artificial intelligence with all the consequences arising from it. All these systems arise based on new knowledge, its transformation into technologies that are embodied in the economy and provide it with appropriate certainty (industrial, informational, digital, neural network economy, etc.).

The income received in addition to the basic income in a society that functions based on information and networks can be called rent-premium. It is always higher than the basic guaranteed income, which is normal (that is, such that ensures the satisfaction of all normal needs) and is appropriated based on the use of the resource, which distinguishes the subject from
others and gives him advantages. The source of rent income is always a value that exceeds normal income (average profit, average bank interest, average salary, etc.) and is appropriated based on monopoly ownership of a resource (land as property, as a business object, special abilities, etc.). Rent is always a phenomenon of monopolization of ownership of a resource, which allows part of the surplus value not to participate in income averaging. In the conditions of the information and network economy, rent-premium income is formed at the expense of the value that remained after providing the basic income of all members of society. The formal basis of its appropriation is ownership of a monopoly resource. Rent-premium income can take the form of intellectual, innovative, qualification rent, rent based on location, etc.

3.3. Emergence of a new economic system. The digitization of the economy is connected both with the change in the nature of production or economic relations, and with the change directly in production forces and factors of production as a result of the implementation of breakthrough technologies, robotization, and the creation of cyber-physical structures, which corresponds to all three levels of the digital economy (Fig. 3) (Ukrainian Institute of the Future, 2022).

The successful experience of digitization of some countries shows that the direct effect of the comprehensive development of the digital economy is 20% of GDP within five years, and the rate of return on investment in digital transformation reaches 500% (Lyubokhinet, L., & Shpulyar, E., 2019). Therefore, technological changes ensure dynamic growth of the economy, development of the business environment and entrepreneurial activity, increase the level of competitiveness of both firms and the country as a whole, which, in turn, leads to an inflow of new investments.

Digitization changes approaches to doing business and the use of information technologies in various spheres of life of economic entities.

The main technologies of the digital transformation of the economy include the development and use of artificial intelligence, the Internet of Things, cloud technologies, digital design and modeling of technological processes, adaptive 3D technologies, electronic document management and governance, mathematical modeling, digital technologies in the field of finance and insurance services. Digital technologies provide an opportunity to effectively develop business, become the basis of productive and production strategies, change traditional business models, and cause the emergence of new products and innovations.

Today, for every high-speed broadband user in the world, five people do not have such a connection. On a global scale, almost 4 billion people do not have access to the Internet at all. About 2 billion people do not use mobile phones, and almost half a billion people live in areas without mobile communications (Ukrainian Institute of the Future, 2022).

The DESI Index (The Digital Economy and Society Index) is used to assess the level of technological development in the countries of the European Union and the degree of introduction of innovative technologies in society and, in particular, in the economy. The index is calculated from 0 to 1. The amount of human capital, the integration of digital technologies, digital public services and the quality of communication facilities are evaluated. In 2020, EU countries received the highest scores for the following components of the DESI index: connectivity (0.62), human capital (0.58) and digital public services (0.64). However, the integration of digital technologies in business activities needs improvement (0.38). According to the value of the
DESI index, in 2020 the leaders in the development of digital technologies among the countries of the European Union are Denmark, Finland, Sweden, the Netherlands, Luxembourg, Ireland, Malta, Estonia, Austria and Germany (Fig. 4) (DESI, 2021).

![Fig. 4 The DESI index for the EU and 10 leading countries in the development of the digital economy](source)

Source: Compiled by the authors based on (DESI, 2021).

For the TOP-10 leading EU countries in the development of the digital economy, the overall DESI index and its components take much higher values than the average for the European Union. In addition, the TOP-10 countries of the leaders included mostly small EU countries. This cluster did not include such countries as France, Italy, Spain, etc. This once again shows the peculiarity of the new wave of globalization and the Fourth Industrial Revolution: small and medium-sized enterprises and small countries can be successful and competitive if they actively implement digital technologies and develop the digital economy.

Thanks to the development of the digital economy, small and medium-sized businesses have received a previously unavailable opportunity to become global. This is what defines the peculiarity of the third wave of globalization, its inclusiveness. In particular, Alibaba founder Jack Ma formulated at the World Economic Forum in Davos (2017): the concept of "30-30-30": over the next 30 years, those who are 30 today and companies with 30 employees will change the world (Pyvovarov, Y).

The World Digital Competitiveness Ranking IMD measures a country's ability to implement and explore digital technologies leading to transformation in government practice, business models and society as a whole. It is formed based on 50 criteria, a large part of which is based on statistical data, as well as on the results of surveys. The first category includes information on research and development costs in this area, broadband Internet speed, and more. There are 63 places in the rating, which are assigned according to the cumulative result, which was shown in three categories:

- "Knowledge": countries are ranked in order of decreasing quality of training, education, science;
- "Technology": here experts divide countries according to the state of Internet and communication technologies, financial capital in the IT industry, as well as the regulatory environment;
- "Readiness for the future": the top positions are given to countries with a high level of readiness to use digital transformation (Sauh, I., et. al., 2019).

3.4. Changing the structure of social reproduction. Using the latest technologies, digitalization changes the picture of competition and blurs the existing boundaries of economic sectors. The global trend of the economy – neo-industrialization – means the priority development of modern material production, its qualitative renewal based on high technologies. The main goal is to restore the role and place of industry in the economy as part of its structural restructuring as a basic component.

Because of such transformations, the cost of transport and communications will decrease, the efficiency of logistics and global networks will increase, and the cost of trade will decrease. All this will open new markets. German industry invests EUR 40 billion in industrial Internet infrastructure every year. The average cost of one workplace in research institutions of advanced countries exceeds 2 million dollars. The cost of individual industrial laboratories reaches 10 billion dollars. The budgets of higher education institutions in the US and China often exceed 5 billion dollars. The total spending of the USA on
research and development in industry is more than 450 billion dollars, China – 200 billion dollars. According to experts, the number of people employed in the scientific and technical sphere in China is approaching 40 million people (Industry 4.0, 2022). As part of the reindustrialization of the economy and its digitalization, the formation of a powerful industrial market, the global renewal of production capacities, the introduction of new technologies and innovative ideas, which requires the integration of production with science and education on a new basis, are necessary. There must be changes in the labor market and education.

Qualitatively new digital elements of productive forces and new socio-economic relations are changing the structure of social reproduction, increasing the space and boundaries of the economy. The growth of labor activity in the creative sphere means that the production of knowledge, that is, science, becomes a component of social reproduction. In other words, in addition to the two traditional divisions of social reproduction (production of investment goods and consumer goods), a third division appears – the production of knowledge. Thus, in highly developed countries, the modern economy is an economy of a mixed market type. Its technical basis is heterogeneous. The dominance of the industrial segment is combined with digital technologies.

**Conclusions and perspectives of further research.** The digitization of the economy is accompanied by a change in the nature of production or economic relations, as well as a change in production forces and factors of production because of the implementation of breakthrough technologies, robotization, and the creation of cyber-physical structures. Digital technologies provide an opportunity to effectively develop business, become the basis of productive and production strategies, change traditional business models, and cause the emergence of new products and innovations. Technological changes ensure dynamic growth of the economy, development of the business environment and entrepreneurial activity, increase the level of competitiveness of both firms and the country as a whole, which, in turn, leads to an influx of new investments.

It is predicted that by 2030, more than 60% of professions will be automated, and plants and factories will be able to improve and modernize independently, that is, with no or minimal human involvement. Business processes, logistics, production cycles will be constantly optimized offline. Under these circumstances, the cost of labor ceases to play a key role in the process of formation of production costs, and the technological potential of the national economy becomes the main factor of socio-economic development.

The essence of modern scientific and technical progress is a system of interconnected four-link machines. They free a person from the direct production process, multiply the functioning of the equipment itself, and increase its efficiency. As a result, there is a sharp increase in labor productivity. Historically new material elements of productive forces are being formed – digital means of production.

Digitization and new technologies affect the conditions of competition in the world. As artificial intelligence and robots are involved in production processes and the service sector, the cost of labor becomes a less important factor in determining a country's competitiveness, while technological competence and the quality of infrastructure, on the contrary, become more important. Such technologies as big data and the Internet of Things help to optimize production processes and reduce operational costs, develop new products and services.

A new stage of automation of machines capable of learning and improving in the process of production activity is beginning. If so far automation has displaced people from the sphere of routine physical work, now progress in the field of machine learning and artificial intelligence will allow starting a large-scale displacement of people already from the sphere of mental work, replacing representatives of routine intellectual work.

Digitization creates digital rent, deepening inequality and socializing the problem of poverty, because of the processing of large amounts of data, those in whose interests they are processed win in advance, and the interests of those who lose are neglected. Digital annuity is nothing but an annuity that allows you to receive income due to the position you occupy in the digital space. The source of rental income in the information and network economy is the value that exceeds normal income and is appropriated based on monopoly ownership of the resource.

Together with the formation of the information and network economy, the relations of universal property are gaining strength, which inevitably come into conflict with private property. The fundamental and main thing is the production of information – a network good, which, unlike ordinary goods, can be simultaneously owned by everyone and used by them. This corresponds not to private, but to universal property.
The added value of digital products and services can only be achieved by using the latest smart technologies. This leads to the transformation of business models aimed at the individualization of the provided goods and services, as well as the emergence of the principle of "everything as a service". The influence of the consumer on the process of product formation increases, when modern information and communication technologies allow combining the satisfaction of individual needs with efficient production in the conditions of the global market. All this leads to the establishment of the era of the consumer in the market.

Qualitatively new digital elements of productive forces and new socio-economic relations are changing the structure of social reproduction, increasing the space and boundaries of the economy. In addition to the two traditional divisions of social reproduction (production of investment goods and consumer goods), a third division appears – the production of knowledge.

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