

Globalization and the Newest Forms of Economic Reality

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Abstract

Research background: Globalization has outlined the contours of a new technological reality in which the emergence of major innovations is due to NBIC-convergence, which has combined the achievements of nanotechnology (N), biotechnology (B), information technology (I) and cognitive science (C). The global nature of the development of information and telecommunication technologies contributed to the formation of the digital economy and the newest forms of economic reality accompanying it.

Purpose of the article: The goal set by the authors is to conduct a study of the latest forms of economic reality associated with the impact of globalization on economic development. It is necessary to analyze the metamorphoses that occur with the forms of knowledge, forms of management, forms of organization of production, etc.

Methods: The basis of the methodological basis of the research was formed by the principles of dialectical logic, historical research, the application of cause-effect and functional-structural analysis, which allow revealing the essence of socio-economic macroeconomic and regional processes, as well as micro-level processes occurring in the digital economy under the influence of globalization.

Findings & Value added: In the course of the research, the identification of the newest forms of economic reality and their signs was carried out. The causal-logical relationship of globalization, the emergence of the newest forms of economic reality, economic transformations and structural shifts in the economy was analyzed. The accompanying changes in economic growth and the impact of these changes on the quality of life are considered.

Keywords: *globalization; economic transformations; structural shifts; economic growth; quality of life*

JEL Classification: *H22; O35; Q42*

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1 Introduction

The beginning of the XXI century was marked by colossal leap forward in the use of resources based on one of the basic substances – information. This is evidenced by the period shortening for mastering of inventions, introducing innovations into everyday life, and the growing pace of technology change. Comparing the time between the appearance of invention and its practical use, we may notice the following. For paper, the period was 1000 years, for steam engine 80 years, telephone – 50 years, airplane – 20 years, transistor technology – 3 years, wave transmissions – 1 year, lasers – only half a year (Abdeev, 1994). Even more impressive is the pace of technology change.

About 10 years have passed since the beginning of commercial implementation of the worldwide network in the late 80s – early 90s of the last century until its widespread distribution in the United States. Today, the world is witnessing a positive dynamic of widespread diffusion of technologies that promise to radically change the existing economic reality. Home robots, consumer 3-D printers, self-measuring devices for blood pressure, blood sugar, oxygen saturation, smart thermostats and consumer drones, virtual and augmented reality devices, and much more tools are becoming habitual. The attributes and forms of the new economic reality become transformation agents in the economy. In this regard, regardless analyzing new forms of economic reality, the study of globalization role in the technology sector development is of particular interest.

2 Methods

The knowledge economy, digitalization and other attributes of modern innovative development are accompanied by profound transformations in all spheres of human life. The increased dynamism of innovative transformations is caused by change of the information's place and role in the process of economic interaction. The simplest example to illustrate the ongoing changes is understanding the difference between conventional data processing and information systems. Data processing accompanies the business activities of economic entities of all levels, while information systems lead to the modification of entities themselves.

Information technology, combining a personal computer, telecommunications and the necessary software, is capable to transform a business and open up prospects for new development directions. This gives advantages in the competitive struggle, allows creating fundamentally new types of business, get the maximum total full effect from productivity growth in all areas of activity, increase the efficiency of all types of communication interaction, etc. (Treviño, Doh, 2021).

Table 1 presents examples of some of the significant changes in the economy associated with the increasing role of information as a resource. Inevitable consequence of transformations listed in Table 1 is changes not only in production, but also in social sphere.

Table 1. Transformations of innovative development

Transformation feature	Production sphere changes	Social sphere changes
Changes in the nature of work activities and the relationship between physical and mental labor due to the active development and implementation of robotics and artificial intelligence systems.	The employment ratio changes in the material production sphere and in the service sphere, reduction in the number of jobs, efficiency growth of labor and production.	The rest time increase as compared to working hours, the emergence of new opportunities for organizing leisure: time for self-education, tourism, cultural enhancement.
Demand decrease for traditional	Ratio changes of extractive,	The most complete

types of raw materials due to increased intensification of the economy information support	refining, processing and infrastructure industries in the economy.	satisfaction of the society environmental needs due to increase in assimilation potential, ensured by the implementation of nature-saving strategies, is increase in environmental culture.
Dynamic technology change	Increase in the economy share of knowledge-intensive industries with minimal resource consumption.	Strengthening the role of highly organized labor, knowledge, intelligence.
Deep institutional transformations highlighting ethical norms, including due to development and implementation of robotics and artificial intelligence systems.	Changing the state role in the production of public goods.	Increasing of environmental, ethnic and other types of responsibility in society.
The emergence of fundamentally new forms of economic reality	Strengthening the special role of knowledge and information not only in production, but also in other types of activity.	Dominance of time and competence factors.
Accelerated dynamism of the world economy	Increased competition at the international level due to creation of global market mechanisms that combine scientific research, material production, education and financial structures.	The global spread of standards of social interaction, revitalizing integration processes in the world economy

Source: Own processing.

Under historical time accelerating conditions, the archaic forms are transformed and the newest economic reality forms are born, such as:

- knowledge forms; management forms;
- production organization forms;
- authority forms;
- property relation forms;
- capital circulation and reproduction forms.

Earlier we mentioned a possible conflict between archaic and modern economic reality forms (Gagulina et al., 2021). In this regard, it seems appropriate to pay special attention to the analysis of the latest economic reality forms.

3. Results: Analysis of the latest economic reality forms

Over just a century quarter, the explosion in applying of information and telecommunication technologies has provided creation of colossal productive potential through processing of knowledge into knowledge, experience into experience. Transformations of innovative development of the 21st century have become possible, particularly, due to the high pace and scale of knowledge transfer into technology.

The newest forms of scientific knowledge, and we are talking specifically about scientific knowledge, are supported mainly by methods based on the use of information support capabilities of fundamental and applied science. These are the latest scientific facts, and the latest scientific problems, hypotheses, laws of science, and the latest scientific theories, etc. It is not knowledge itself that has economic value, but scientific knowledge containing both social and natural scientific knowledge.

Applying of the latest scientific knowledge forms in practice leads to large-scale interrelated transformations in all spheres of socio-ecological and economic system: in management, technology, communications, etc. By increased information quanta reception and transmission rate increases the communication speed, improve transport and logistics links, increasing the mobility of material objects.

With mobility growth, also increases the speed of using material objects in technology processes, affecting the efficiency of solving many control problems. These processes are most noticeable in large vertically integrated structures. Due to destruction, erosion of traditional boundaries of firms and the volume increase of virtual business space, occurs alignment and decentralization of such structures. The global manifestation of these structural transformations has become the consequences of the widespread practice of applying "antiquated" restrictions throughout the world. Online work has expanded the boundaries of workspace and extended them into the home space, while blurring the line between work and leisure (Brakman et al., 2021).

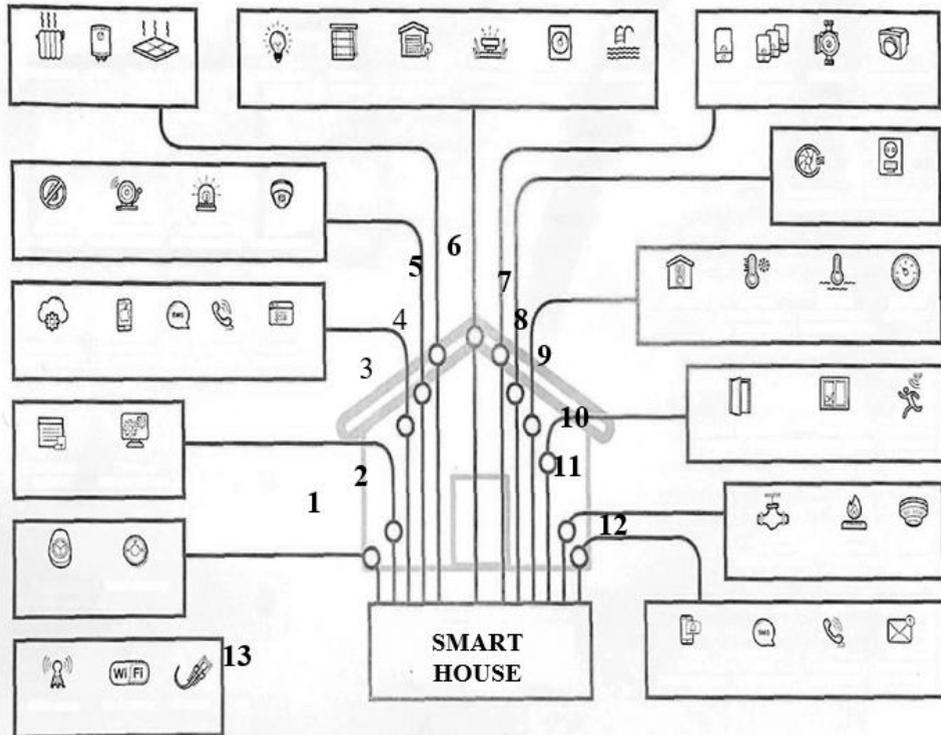
The emergence of new interactions and processes, multiple strengthening of the role of cause-and-effect relationships led to the emergence of the newest management forms. Forming a new technology environment, information and innovative technologies change the actual way of obtaining and transforming knowledge. Technological changes in the IT industry are giving rise to creation of computers and processors that address new needs in areas such as machine learning and low-cost, low-power IoT devices. The new technological environment is also blurring the boundaries of business and home space. As good example is intelligent or "smart" technologies that form the basis for building a "smart home", "smart city".

Development and production of M2M solutions for remote control and dispatching of engineering systems, heating systems, security complexes for premises, vehicle monitoring systems, etc., are aimed at increasing the efficiency of engineering systems management, automation, control of private houses, municipal institutions, industrial and warehouse complexes. "Smart" devices provide effective status monitoring of the main systems of industrial and economic facilities and, thereby, contribute to the creation of optimal control mode for the entire facility (Figure 1).

The start of the Internet of Things became possible thanks to easy access to the network from anywhere in space, and customer self-service opened the door for future agents and bots. Bots represent increasingly tangible example of artificial intelligence for the user, which, along with the industrial Internet and the distributed ledger (blockchain), refers to the "end-to-end" digital technologies.

In the very near future, great prospects for development of the latest management forms and the newest business organization forms are opening up for algorithmic management, which already today finds application in managing the work of couriers, drivers of certain types of transport, etc.

Information management, storage and transmission at the lowest possible cost in the digitalization era gives rise to the latest production organization forms in almost every scientific and technology sphere. Information and telecommunication technologies have given impetus to the creation and dissemination of network structures, created conditions for changing of business communities. The emergence of most of the newest business organization forms would not have been possible if continuous computerization did not noticeably facilitate the launch of new companies.



1 - "Remote Keyfob-Touch Memory" Unit; 2 - "Operation Scenarios - Ready Configurations" Unit; 3 - "Webservice-iOS Application and Android-SMS-Dialing-Control Panel" Unit; 4 - "Leaks Protection - Fire Alarm - Security Alarm - Video surveillance" Unit; 5 - "Heating-DHW-Warm floor" Unit; 6 - "Lighting-Curtains and Blinds - Gates and Barriers -Auto-Irrigation-Bath, Sauna Pool"; 7 - "Boiler-Cascade of Boilers-Pumps-Servo Drives" Unit; 8 - "Exhaust Ventilation - Various Electrical Appliances" Unit; 9 - "Room Temperature Sensor - Outdoor Temperature Sensor - Coolant Temperature Sensor - Pressure Sensor" Unit; 10 - "Door Opening Sensor, Windows - Glass Break Sensor - Motion Sensor" Unit; 11 - "Water Leakage Sensor - Gas Leakage Sensor - Smoke Sensor" Unit; 12 - "Push-Notifications-SMS-Notifications-Voice Messages-E-mail Notifications" Unit; 13 - "GSM-communication-Wi-Fi Communication-Ethernet" Communication Unit

Figure 1. Application of M2M technologies in "smart" home.

Source: Own processing.

Another promising direction for development of the latest economic reality forms is indicated by unmanned aerial vehicles. Unmanned aerial vehicles are at the same time the sphere of introducing the latest scientific knowledge forms, the latest management forms, the latest production organization forms, and even the latest property relation forms. The application range for unmanned aerial vehicles is quite wide, and unmanned aerial vehicles are in demand for both civil and military purposes.

The list of top industries for civilian use of drones in the United States has more than 13 positions (Boyko, 2021). As of 2015, the top ten top industries included photography, real estate, utilities, construction, agriculture, education, etc. Such well-known companies as BT, Facebook, Balfour Beauty, EasyJet are engaged in the implementation of drones in their infrastructure. Unmanned aerial vehicles solve many problems, but the main task is to collect and transmit information using the latest technologies. That is why drones play a huge role in the general development of IT industry and the knowledge economy.

The transformation of public relations and world views in the knowledge economy with ICT technologies leads to the formation of the newest authority forms. The basis of such forms is knowledge, intelligence and everything that is embodied in totality of human and social capital.

Mass media, information space of the Internet, which seriously affect public opinion and voices of voters, are becoming wide field for manifestation and implementation of the latest authority forms. The penetration of digital and IT technologies into political relations leads to the fact that, parallel with real space, there is active construction of digital (virtual) space (Konkov, 2019). This opportunity appeared in the course of universalization by digital technologies of the former variety of available means, such as language, audio-visual instruments, etc.

According to K. Schwab, the World Economic Forum Founder, is now collection of "computers, software and networks ... so complex and integrated that they can already transform societies and the global economy" (Schwab, 2016). For example, such form of public policy as deliberation, designated by J. Habermas as benchmark for development of democracy (Habermas, 1992)", is currently actively developing inward, taking the form of small discussions.

Digital platforms are becoming an increasingly popular tool for implementation of the latest authority forms (Hänninen & Smedlund, 2021). They find application at all authority levels: from e-government to municipality level. In this case, there is delegation (varying degrees) of decision-making from the competent entity to the corresponding digital system: algorithm that carries out sequence of necessary procedures without participation of the subject himself. Digitalization of political relations contributes to reproduction of "dual-core" public administration structure, which combines mechanisms of representation of public interests with further movement towards formation of "second unofficial, parallel state" with its own virtual social connections (Soloviev, 2019).

Another newer economic reality form concerns property relations. This form is associated with transformation of information into private property object and is positioned as intellectual and informational property, which contributes to the strengthening of private property relations. The emergence of the newest property relation forms transforms the entire structure of socio-economic relations. The owners of intellectual and informational property are often poly-subject, and the emergence of new forms of assets contributes to depersonification of owners.

Changes in value chains and digitalization of economic processes in innovative economy lead to revaluation of traditional assets, their inventory, to change in their form and content. At the same time, the emergence of new categories, such as digital assets, is of particular interest. Impulse for the emergence of digital assets is given by cross-industry changes against the background of convergence of businesses from various industries, introduction of end-to-end digital processes for transition of all vital spheres of people's social life to new digital mechanisms.

Digital assets become part of the mechanism functioning, which includes both the latest property relation forms and the latest capital circulation and reproduction forms. Considering that the capital formation occurs by changing the money existence form in the exchange process, the capital radical transformation takes place during the economy digitalization. The advanced and invested capital goes into form of active, productive capital when digital assets are formed.

Formation of the newest capital circulation and reproduction form, to greater extent than other newest economic reality forms, is predetermined by accelerated intensification of the digital economy. Practically all capital reproduction stages under influence of intensification of information processes have been accelerated many times, i.e. more and

more useful information is used at each stage and at each stage, creating conditions for optimizing capital management processes.

The financial sector virtualization manifested itself and outlined its position earlier than other economy sectors. With occurrence of electronic money and cryptocurrencies in Russia, it became necessary to produce its own digital currency. According to the Ministry of Finance plans, outlined in the Strategy for the Development of the Financial Market until 2030, the digital ruble will become the third official means of payment in the country, along with cash and non-cash money (Strategy for Development of the Financial Market of the Russian Federation).

The other side of formation of the newest capital circulation and reproduction forms is due to the strengthening of the science and technology role in the knowledge economy. The capital reproduction process quality and structure have their own distinctive features in the knowledge economy:

- movement of science capital for development of scientific potential;
- transformation of production through new equipment and technologies;
- formation of independent market by science product wherein intelligent and information products circulate: patents, licenses, know-how, etc.

Summing up the analysis of the latest economic reality forms, the following can be noted. The noticeable influence of advanced development of information and telecommunication technologies, digital communication networks and virtual reality has created preconditions for increasing economic efficiency in all economy spheres. This was reflected in labor productivity increase, calculation accuracy increase, and decision-making efficiency increase. New type of financial and economic relations was established.

Profitability drop in the real sector, effectiveness decrease of classical methods of economic regulation, shift of the center of profit formation and added value to the service sector, financial system virtualization, etc., has led to the emergence of the latest economic reality forms all over the world. The renewal of living environment of modern society, caused by these processes, becomes the source of subsequent economic transformations and structural changes in the economy.

Knowledge and information, which are today the main value, create preconditions for growth of transformative innovations in the economy that change the living standards.

4. Discussions

Modern economic reality is characterized by such innovative globalization form as formation of information space covering the whole world. This became possible against the background of formation of world markets for goods, labor and capital, as well as liberalization, which created conditions for the effective use of information and telecommunication technologies. In its turn, informatization has led to the emergence of new capital-intensive and rapidly growing markets for information and communication technologies and mass media.

Development of the newest economic reality forms was largely facilitated by promotion of the individual consumption principle, which focuses on the fullest satisfaction of the needs of each person. Globally, the individual consumption principle has become powerful argument in favour of the widespread introduction and expanded use of IT technologies and economy digitalizing tools.

Digitalization in Russia today is driven by end-to-end (basic) technologies, including the industrial Internet, including the Internet of Things and smart cities, open source public access platforms, and cloud information technologies. There is dynamic capitalization of the Internet business and info-business, accumulation and volume growth of financial assets, the birth of their new forms (digital assets). Predictive software and algorithmic

management has been emerged. The influence of "new media" and many others things is growing (Sycheva et al., 2020; Banalieva and Dhanaraj, 2019; Wojciech Kopczuk et al., 2010). To test the latest technologies, legal restrictions are softened or completely abolished, and special legal regimes are introduced. This is no coincidence, because it is technology that has enabled globalization.

Globally, the latest technologies in the digital economy are both driving growth and saving money. Applying the supply and demand theory terminology, it can be argued that economic growth is determined mainly by supply, since new markets and jobs are created by innovative technology companies, and savings are driven by demand by companies that use technology to improve their business activities. This means that economic growth in the digital economy is closely tied to the positive performance of technology providers, while the more numerous technology consumers benefit from savings.

Globalization has put the technology sector into highly controversial position. On the one hand, economic growth without technology is impossible; on the other hand, the attitude towards the general technology impact on society is becoming more and more tense for number of reasons, some of which are shown in Figure 2.

Another major challenge for the globalized development of IT industry is the growing inequality that is embedded in the underlying Internet economy. According to the Russian service BBC NEWS, the assets of the world's eight richest people are equal to those of the poorest 3.6 billion. Among the richest people are the owners or co-owners of global giant companies whose wealth is based on digital platforms embedded in the global economy, such as Google, Facebook, Amazon, etc.

The colossal separation of the IT industry giants from the rest of the companies became possible, first of all, due to the continuous digital automation of technology processes. Technological solutions implemented by such companies make it possible to practically avoid personnel costs and transfer customers to self-service. Software agents and chat-bots are already pretty good at doing this on Amazon, Google or Facebook. Similar technological solutions are beginning to be practiced in banks, retail stores, fast food restaurants, etc.

At the same time, the global rivalry in technology cannot be limited to the competition of the IT industry giants. National economies have been and remain major players. USA, China, Japan, Korea, India, EU countries and, of course, Russia are the largest participants. The subject of the competition is technological advances in machine intelligence, biotechnology and bioproduction, robotics, new materials and 3-D printing, quantum computers, self-driving cars, personalized medicine, precision farming, drone, blockchain, etc. Each country has its own advantages and weaknesses, but all are united by the presence of an IT development strategy adopted at the national level.

The decisive role of information technology in the digital economy stimulates search for solutions that will open up new opportunities to increase the country's competitiveness in the global economy. In this context, the use of quality economics tools is of particular interest. The quality economics tools accompany development, implementation and application of information technologies. Standardization, metrology, quality management are traditionally satellites of scientific and technological progress. Today, when quality improvement becomes the core of state policy to ensure economic growth and form long-term development strategy, the role of quality economy tools is increasing many times over (Okrepilov et al., 2020).

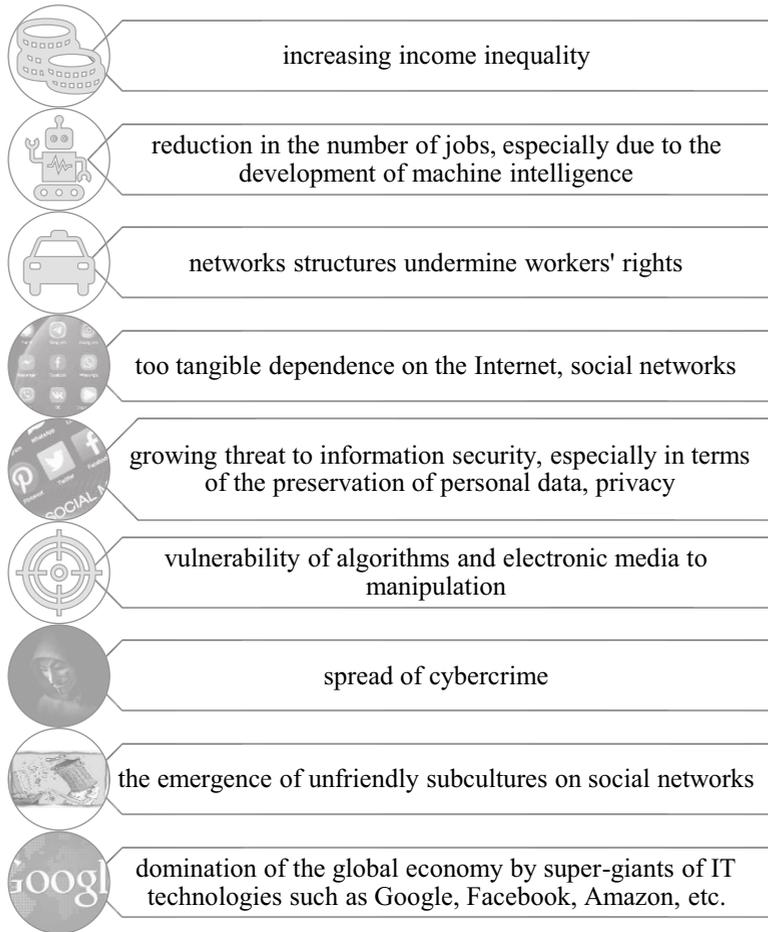


Fig. 2. Problematic Areas of the Impact of Technology on the Economy

The majority of not only Russian, but also foreign scientists studying the problems of the digital economy are inclined to believe that the basis for further economic growth, along with other instruments of macroeconomic policy, should be based on the prevailing introduction of information technologies in all sectors. IT technologies are becoming driver of the digital economy, as they contribute to the creation of powerful infrastructure in which computing, information and communication resources are integrated (Kim & Park, 2021).

The emergence of the latest economic reality forms in the key modern economy sectors: science and education, transport and communications, trade and finance, in the information infrastructure changes the vector of transformation in the economy and reveals significant reserves for saving and reducing losses of various kinds (Novikov et al., 2021). There is increase in the business space virtualization, which creates favorable conditions for rapid transfer of capital between areas of activity, consolidation of scattered financial resources, and increased efficiency in the use of investments. Information infrastructure saturated with IT technologies accelerates adoption and validity of management decisions.

5 Conclusions

The new technological reality and the accompanying digitalization are reflected in the emergence of such increasingly popular concepts as Education 4.0, Quality 4.0, Industry 4.0. This is not surprising: according to McKinsey&Company forecasts, the knowledge economy by 2025 will provide from 19 to 34% of GDP growth (Aptekman et al., 2017).

The prospects for technological change in the knowledge economy are impressive. According to forecasts, the production cost decrease and operation of computer equipment on nanotechnological basis will make it possible to multiply the use of technology due to its miniaturization and adaptation to specific consumer needs.

With development of digital technologies, classic intermediary companies are being squeezed out of the market by the owners of digital platforms. And in the face of increasing global risks, such as the coronavirus pandemic, humanity has learned a new reality in which it is precisely intelligent technologies that still allow the economy to maintain delicate balance.

Breakthrough in the key knowledge economy sectors – science and education, bioinformatics and biomedicine, pharmaceuticals and bioengineering, as well as in related fields will allow moving to qualitatively new economic development level, achieving higher standards in ensuring the life quality.

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