

# Features of the National Economy Development based on Digitalization and Achieving Sustainable Development Goals

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## Abstract

Current trends of globalization create conditions, which are difficult-to-predict for national economies of countries of the world, which creates constant challenges to ensure sustainable development (SD). The main goal of this scientific paper is to study achievement of sustainable development goals of the national economy. To achieve the goal, authors used following scientific methods: logical method, dialectical method, monographic and comparative method, method of formalization, synthesis and abstraction, systemic, institutional, resource and graphic method. Impact of pandemic on active digital transformations and development of innovations is substantiated. It was determined that the digital economy sphere is one of the priority factors influencing sustainable development under post-pandemic conditions and has significant potential for implementation in all spheres of the national economy. Using the SWOT analysis, strengths and weaknesses of digitization and its impact on sustainable development of the national economy, as well as existing opportunities and threats, are identified. Influence of the main types of digital technologies on achievement of specific sustainable development goals is determined.

**Keywords:** Global Goals, Sustainable Development, Sustainable Development Goals, National Economy, Public Administration, Digitalization, Digital Innovations.

## Introduction

Under current realities of post-pandemic transformations of national economies and globalization processes, sustainable development is closely interconnected with digital transformations, experiencing both negative and positive influences. Environment of the digital economy is a newly formed structure that caused significant transformations in all spheres of the national economy and formed foundations of the state and municipal management system development based on new conditions to ensure implementation of sustainable development goals (SDGs).

Sustainable development of the national economy requires ability to maintain certain directions and trends regardless of influence of threats from the environment. At the same time, synonymy of this concept with the term "progress" is assumed, and possibility of progressive transition of all spheres of the national economy to new levels of functioning is determined. This process occurs in parallel with growth of business capitalization, spread of innovative transformations, and emergence of social responsibility.

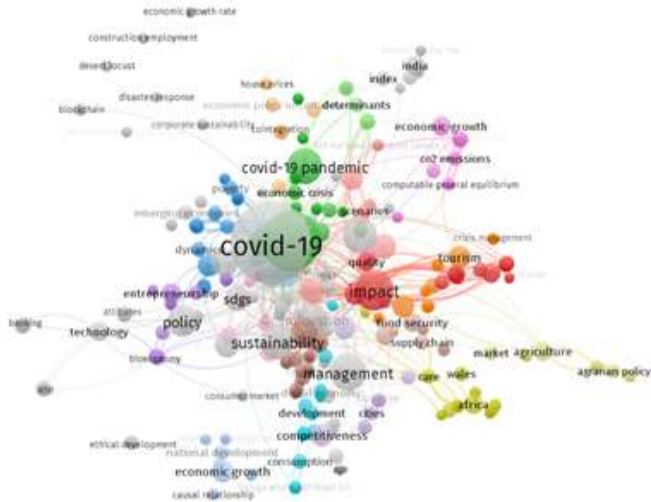
The main goal of this scientific paper is to study achievement of sustainable development goals of the national economy.

Literature Review

Sustainable development of the national economy is studied by many domestic and foreign scientists (Abeydeera et al., 2016; Kosach et al., 2022; Arefiev et al., 2022). Despite active discussions about formation of the digital economy, most researchers agree that under current realities it is one of determining factors of sustainable development (Ivanova et al., 2022; Abramova et al., 2021; Shaposhnykov et al., 2021). Opinions of researchers about influence of the digital economy are paradoxical: on the one hand, it is emphasized that general digitalization has a positive effect on achievement of sustainable development goals (Djakona et al., 2021; Marhasova et al., 2023; Popelo et al., 2023), and at the same time it is perceived as a threat to certain components of sustainable development (Ostrovskaya et al., 2023; Nikiforov et al., 2022; Shylepnytskyi et al., 2023).

To achieve goals, which demonstrate relevance of the article, the bibliometric analysis using the in-built Web of Science instrument and VOSviewer (Pasko et al., 2021; Shome et al., 2023; Zhavoronok et al., 2022) will be used. The research sample consisted of articles from the Web of Science scientometric database, which titles and keywords contain words "sustainable development" and "national economy" (Fig. 1).

Figure 1: Visualization of global research trends, which contain words "sustainable development" and "national economy" in Web of Science for 2020–2023



Source: systematized by authors

Step-by-step bibliometric analysis of identified publications (236 articles) showed high relevance of the topic to ensure achievement of sustainable development goals of the national economy: trends and challenges in pandemic conditions.

Active digitalization during the pandemic proved significant impact of digital innovation on achieving sustainable development goals, which proves necessity and relevance of further research on this topic.

Methodology

Within the scope of the study, scientific methods were used as follows:

- logical method – justification of the pandemic impact on activer digital transformations and development of innovations;
- dialectical method – establishing relationships and identifying contradictions in ensuring economic and environmental sustainability under the influence of economy digitalization;
- monographic and comparative methods - substantiation of practical recommendations in development of the SWOT analysis;
- method of formalization, synthesis and abstraction - proving priority of digitalization and analyzing its impact on sustainable development under post-pandemic conditions, outlining significant potential for

- implementation in all spheres of the national economy;
- systemic, institutional, resource - determination of the impact of the main types of digital innovations on achievement of sustainable development goals;
- graphic method - for systematization and visual representation of research results.

## Results

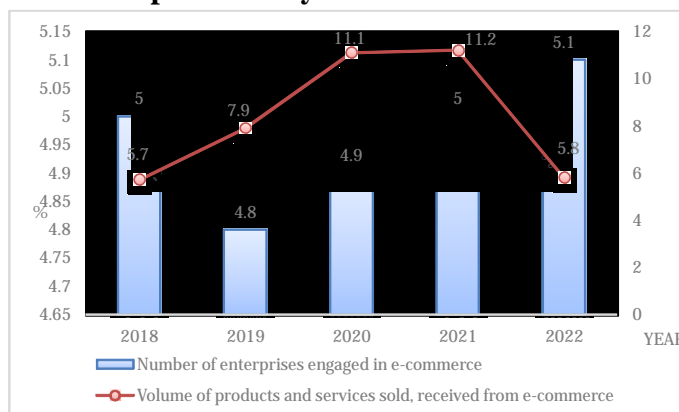
Issue of sustainable development of the national economy has been significantly intensified during the pandemic and has a tendency to remain relevant in the near future. This applies to the economic sphere and social component and means that consumers of goods and services, state regulatory bodies, direct participants in logistics networks, financial organizations will try to assess in the future how this or that business structure responsibly approaches implementation of sustainable development goals. At the same time, issue of social responsibility of business and development of appropriate strategic measures is actualized. Under these conditions, ethical reporting becomes the norm in business.

Current trends of globalization create difficult-to-predict conditions for national economies, which causes constant challenges to ensure sustainable development. One of these influential factors was pandemic, which caused increased development pace of technologies and innovations, contributed to increasing the value of information resources for existing social and economic system, and intensified development and implementation of new methods and approaches to data processing. Transition to digitalization of social life has long since begun to dictate new conditions for the company's activity, survival, and sustainability, one of these conditions being introduction of digital transformations into all spheres of the national economy.

Activation of digitization took place against the background of the pandemic, when transition to organization of work in online format became forced, and later it was able to prove its relevance. Since first weeks of the pandemic, companies have had to rapidly implement digital tools that have helped them adapt to new conditions. Faced with threat of a global crisis, managers fully realized that digitalization is a key to business continuity. At the

same time, concrete results and consequences of implementation of digital technologies prove that digital transformation can become foundation of environmentally sustainable future for everyone (Fig. 2).

**Figure 2. Indicators of the use of digital capabilities by business entities**



Source: systematized by the authors based on (State Statistics Service of Ukraine)

As we can see, the difficult business environment has given rise to the intensification of the use of the latest digital business technologies, which has not catastrophically reduced trade turnover but has begun to increase real turnover. The country, supporting global trends in pandemic business conditions, has fully embarked on the path of e-commerce development. These conditions are reflected in the growth of exports of Ukraine's IT industry. Also, the number of enterprises whose employees have remote access has increased (from 42.03% in 2018 to 63.5% in 2023), as well as the share of the number of employees with remote access (from 8.2% to 17.7%). However, it should be noted that these processes have somewhat slowed down as a result of Russia's full-scale invasion of Ukraine, which led to business liquidation, relocation to the central and western parts of the country, or even relocation outside the territory of Ukraine.

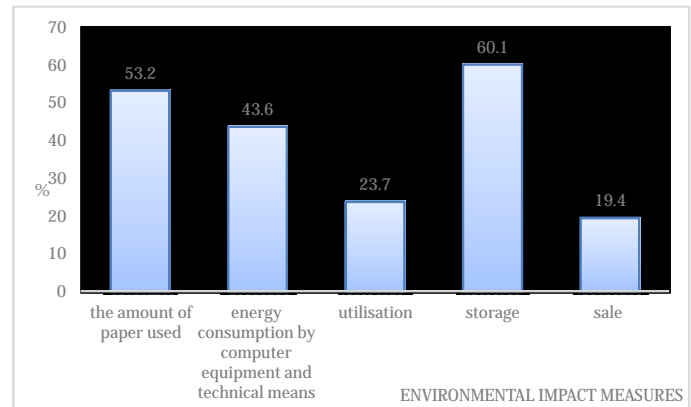
Changing business patterns have necessitated the urgent introduction of effective ICT and staff training. Thus, compared to 2018, the number of such businesses increased from 3.7% to 4.3%, continuing to grow. For example, in 2023, the share of businesses that organised online events, meetings, and conferences via the Internet in real time was

more than 30% of the total number of businesses. The share of enterprises using artificial intelligence technologies in their operations is growing every year - while in 2018 this figure was 2.6%, at the end of 2023 it was 5.4% (for sales, production processes, business administration and management, logistics, ICT security, human resources, etc.)

At the beginning of the pandemic, companies and institutions in all spheres of activity managed to rapidly introduce digital tools in their activities and spread the use of information technologies, which contributed to adapted new conditions(Fig. 3).

The generation of electronic documentation, including invoices, expense invoices, and reports as part of business management processes, has contributed to a positive trend in reducing the use of paper and, from an energy perspective, has made it possible to significantly save this resource.

**Figure 3. Indicators of the impact of digitalisation of business entities on environmental impact measures**



Source: systematized by the authors based on (State Statistics Service of Ukraine)

During the first time of the pandemic, companies and institutions in all spheres of activity managed to rapidly introduce digital tools in their activities and spread the use of information technologies, which contributed to adaptation to new conditions(Table 1).

**Table 1. Share of the number of enterprises that analysed big data**

Indicator	2018	2019	2020	2021	2022
based on data received from smart devices or sensor -based on geolocation data received	5,9	5,7	5,7	-	2,1
from handheld devices	3,4	3,7	4,0	-	4,5
based on data generated from social media	3,3	3,3	3,4	-	3,0
based on other sources	6,0	5,6	5,8	-	2,6

Source: systematized by the authors based on (State Statistics Service of Ukraine)

The complexity of management processes has only increased the need to find ways to quickly process large amounts of data, and digital technologies have been able to solve them by processing databases obtained from smart devices or sensors, geolocation data, data generated from social media, etc. At the same time, digital security issues need to be addressed (unavailability of digital services due to hardware or software failures, external attacks, destruction or corruption of data due to hardware or software failures, malware infection or unauthorised intrusion, disclosure of confidential data through intrusion,

pharming, phishing attacks, etc.)

Digital transformation, in addition to impact on production activities, formed foundation for environmental sustainability. Reformatting and using new approaches to business process management has specific advantages, namely:

- creates conditions for saving financial resources;
- makes it possible to extend service life of equipment;
- reduces negative impact on environment.

It is obvious that digital economy in terms of influence on sustainable development is diverse and has significant potential. For example, mergers and acquisitions of companies are actively taking place precisely under digitalization processes. Formation of innovative ecosystems is also actively developing in digitalization conditions, since digital technologies significantly affect ecosystem formation and changes in its structure. In economic aspect, digitalization changes format of interaction of market participants, contributes to industry clustering and structures formation of strategic network.

Sustainable development of the national economy consolidates positive economic trends, but their achievement depends on the state of economic security of business entities and is a guarantee of implementation of national security measures. Thus, functioning of economic security system of economic entities should focus primarily on their sustainable economic development. This is a priority for those areas of the national economy that are characterized by low level of adaptability to endogenous and exogenous threats. However, for many companies, digital transformation is taking place too slowly, first of all, it concerns strategic planning, optimization of logistics and communication technologies.

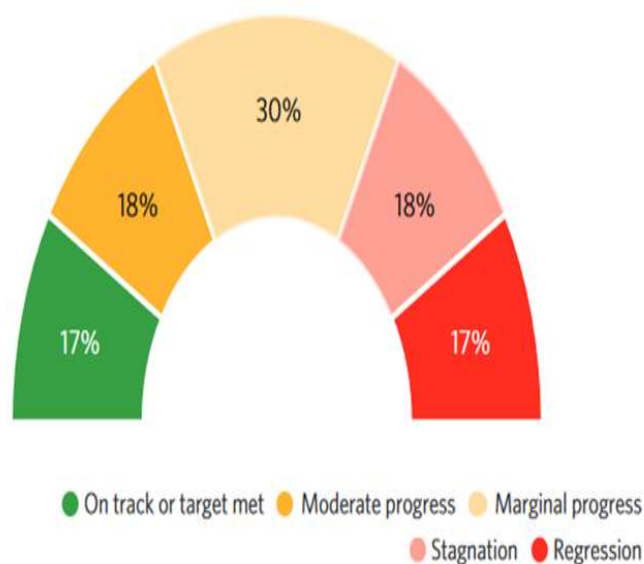
According to the report (United Nations, 2024) on the implementation of the 2024 SDGs, certain deviations from the planned indicators for the period of 2030 can be noted. In Fig. 4 provides information on overall progress on the goals based on global aggregate data for 2015-2024 and progress assessment for the 17 Goals based on assessed targets. Based on the ranking of EU countries based on the results of achieving the SDGs, it should be noted that the top 5 countries in the ranking were: Ireland, Cyprus, Luxembourg, Lithuania and Norway (Eurostat, 2023).

Let's determine how digital technologies influence achievement sustainable development goals of the national economy. Parallel implementation of digital initiatives in companies has a positive impact both for business itself and for the environment. So, as experience of leading companies shows, transition from local infrastructure to cloud technologies allows enterprises reducing their server

capacity by 77%, electricity consumption by 84% and carbon dioxide emissions by 88%. Environmental sustainability as a component of sustainable development is currently under influence of the following key factors: global warming, closed-loop economy, transition to renewable energy sources and transparency of supply chains. Business should take into account that production greeninfg and, accordingly, its transformation can be achieved, including through implementation of digital innovations, introduction of effective environmental management system, and use of available opportunities aimed at resource-saving actions.

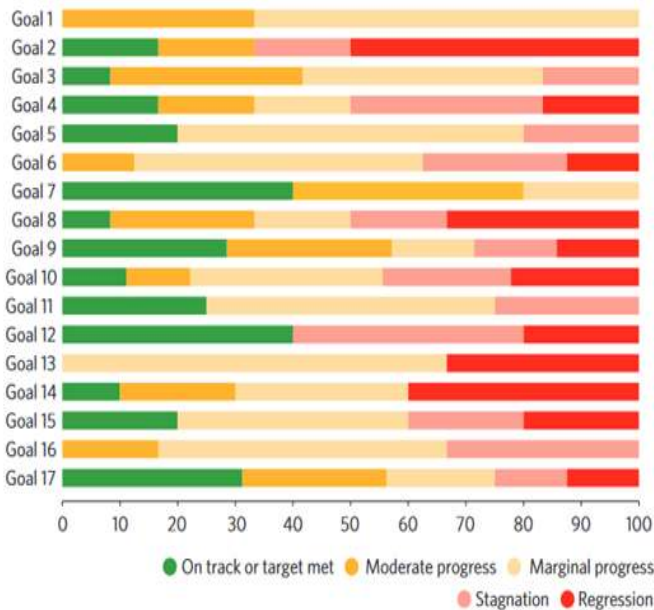
Implementation of digital transformation processes helps to optimize productivity and efficiency of working with data. At the same time, in the context of sustainable development, CO2 emissions are being reduced and the problem of waste management is being solved. There is already scientific evidence that due to active implementation of information technologies by companies, CO2 emissions in energy, agriculture, manufacturing, construction, as well as in transport can be reduced by 15%.

**Overall progress across targets based on 2015-2024 global aggregate data**



### Progress assessment for the 17 Goals based on assessed targets, by Goal

**Fig. 4. Progress assessment for the SDGs, 2015-2024**



Source: United Nations (2024)

Ensuring greening is also due to implementation of blockchain technologies, which have significant potential for creating the closed-loop economy and simultaneously reducing transaction costs, increasing privacy, and ensuring environmental sustainability. Digitization of production systems will further affect providing employment and reducing unemployment, rational use of raw materials, minimization of emissions and economical consumption of energy resources. In the future, this will allow achieving several sustainable development goals, as follows: ensuring food security, healthy lifestyle, promoting industrialization and innovation, and reducing inequality among countries.

Innovative processes, namely transition to using quantum technologies, contribute to optimization of the operation of power plants and oil refineries, which contributes to realization of sustainable development goals, i.e: ensuring efficient use of water resources, promoting continuous and sustainability. Due to use of digital platforms as the basis of the economy of shared consumption, it becomes possible to carry out economic transactions without mediation. At the

same time, platforms act as an element of the digital infrastructure and can create network effects, improving market interaction and connecting demand and supply in time. Thus, it is possible to monitor effectiveness of the circular economy formation, solving the problems of productive employment and applying innovative approaches to consumption and production.

The conducted studies show prevalence of projects aimed at ensuring gender equality, implementing a "green" economy, combating climate change, and preserving natural ecosystems. On the other hand, there is also negative side of active integration of information technologies into various branches of the national economy. There is a threat of possible emergence of partial monopolies in the digital environment, which carries a corresponding risk for inclusive sustainable development.

Management processes at various levels have undergone transformations in the context of active actions on implementation of the concept of electronic government. Using government digital platforms has made access to public services fast and transparent, thus ensuring achievement of democratic goals by governments. Active use of crowdsourcing promotes involvement of investors in implementation of various projects, which helps to effectively solve social and economic problems, primarily at the regional level. Thus, by ensuring effective functioning of various spheres of the economy and, above all, production sector, new approaches to creating jobs in the labor market, reducing costs of services and changing the lifestyle of the population, use of high-tech digital tools affects ability of the national economy to sustain and adapt. Blockchain can improve exchange of information between government institutions and society and, in the future, will bring changes to the system of democracy and governance. Social networks are also an integral part of political campaign management and strategies, allowing public leaders to establish two-way communication with citizens.

On the other hand, it is important to note existing limitations, namely: strengthening of digital divide, consolidation of power, control and violations of privacy, stimulation of excessive consumption, changes taking place in the labor market.

The conducted scientific work of impact of digital technologies on achieving sustainable development goals of the national economy made it possible to identify strengths and weaknesses of digitalization, as well as existing opportunities and threats (Table 2).

**Table 2. SWOT analysis of the impact of digital technologies on achieving sustainable development goals of the national economy**

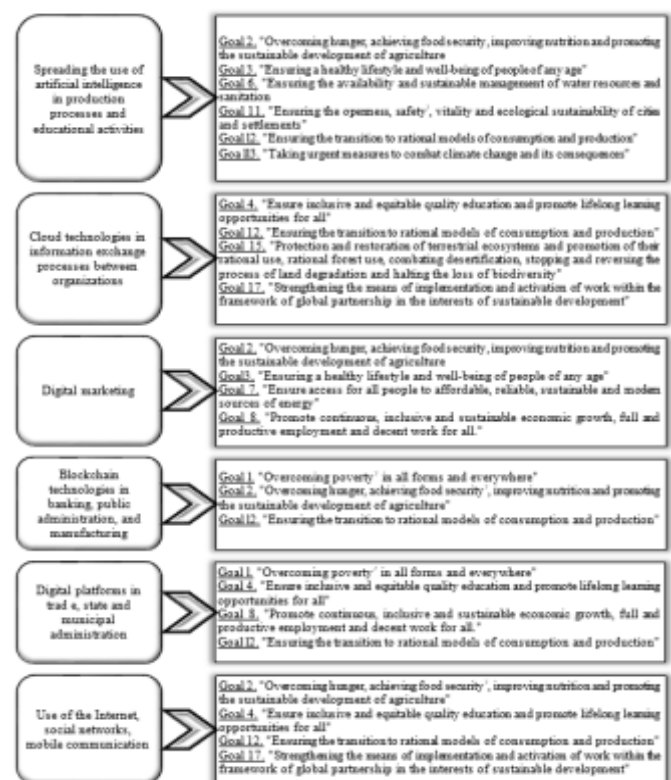
Strengths	Weaknesses
<ul style="list-style-type: none"> <li>- the active introduction of automation of processes during the implementation of economic transactions contributes to the efficiency of management;</li> <li>- the ability to process large amounts of information;</li> <li>- possibility of cost reduction and efficient management of reserves;</li> <li>- ensuring a stable market position for enterprises</li> </ul>	<ul style="list-style-type: none"> <li>- imperfection of the institutional mechanism of state management of the introduction of digital technologies;</li> <li>- different level of development of economic systems, which leads to an uneven process of digitization and the difficulty of implementing strategic state policy in this direction;</li> <li>- shortage of professional personnel with appropriate training;</li> <li>- low level of digital literacy of the population</li> </ul>
Opportunities	Threats
<ul style="list-style-type: none"> <li>- creation of conditions for the transformation of business processes of company management;</li> <li>- increasing access to certain types of resources and their effective use;</li> <li>- the emergence of new professions on the labor market and the possibility of social integration for certain groups of the population;</li> <li>- accessibility and transparency of public services</li> </ul>	<ul style="list-style-type: none"> <li>- an increase in the level of unemployment due to reformatting of the labor market;</li> <li>- strengthening of the digital divide due to the uneven socio-economic development of individual regions and territories;</li> <li>- spread of cyber threats and risks of information exchange, increase in the number of fake threats;</li> <li>- increased load on the resource base</li> </ul>

Source: developed by the authors

It is worth noting that the pandemic has affected behavior culture, communication format, and transformation of worldview of citizens. The pandemic acted as a catalyst for digital competences in many countries. However, at the same time, permanent risks and threats related to ensuring reliability and security of information, low level of digital literacy of the population, which is manifested in distrust of online transactions, appeared. This requires educational work to increase the level of digital literacy, first of all through active introduction of digital technologies into educational activities and ensuring education level in transformations taking place in the national economy.

As stated at the Political Forum on Sustainable Development under auspices of the UN Economic and Social Council (Millennium Development Goals), based on use of modern information technologies, it becomes possible to achieve at least 10 sustainable development goals, that is, most of indicators reflecting interrelationship of interests of future and present generations, can be realistically achieved through wide implementation of digital technologies. This research allows determining achievement of the goals (Fig. 5).

**Figure 5. Use of digital technologies in achieving sustainable development goals of the national economy**



Source: developed by authors

Use of digital technologies for the national economy makes it possible to find balance between leveling of technological security risks, most of which are destructive to natural environment, and possible strengthening of sustainability of socio-economic development. Collectively, the analyzed digital technologies play transforming and stimulating role in achieving sustainable development goals, which actualize integration of strategy on developing digital innovations into the global agenda of sustainable development of the world economy.

## Discussion

Marhasova et al. (2023) and Djakona et al. (2021) consider introduction of digital technologies as one of the main trends to ensure achievement of sustainable development goals of the national economy. We share the ideas of Ivanov et al. (2022), Pasko et al. (2021) and Abeydeera et al. (2016) that ensuring achievement of sustainable development goals of the national economy requires cooperation of government, business and society. Government must create a legal and regulatory framework that promotes sustainable development. Business must invest in sustainable technologies and practices. Society should be interested in sustainable development and support measures aimed at its achievement.

Zhang et al. (2022) and Zhou et al. (2023) determine that ensuring achievement of sustainable development goals of the national economy is complex task that requires a lot of effort, with which we fully agree.

We support the studies of Bai et al. (2021), Guo et al. (2022) and Putri et al. (2023) that the COVID-19 pandemic has led to new challenges for ensuring achievement of sustainable development goals of the national economy, which can be attributed to decrease in economic activity (the pandemic has led to decrease in economic activity in many countries of the world, which makes it difficult to finance measures aimed at sustainable development); increasing inequality (the pandemic has led to increase in inequality in many countries of the world, which makes it difficult to achieve sustainable development goals, which are aimed at improving the well-being of all people); climate change (the pandemic has not led to reduction in greenhouse gas

emissions, which defines the problem of climate change and requires urgent action).

Despite these challenges, ensuring achievement of sustainable development goals of the national economy remains an important task. For its implementation, it is expedient to establish effective cooperation between government, business and society.

## Conclusion

Digitalization of economic processes affects sustainable development of the national economy, creates conditions for starting competitive business, and ensures adequate standard of living of citizens. However, existing risks of digital transformations require formation of partnerships between governments of countries, businesses, and non-governmental organizations to develop adaptive policy of state regulation to counteract existing and potential threats to achieve sustainable development goals. To optimize use of digital technologies and obtain positive results, it is necessary to manage all aspects of economic and social life, namely implementation of state programs for managing benefits and risks of digitalization, regulating consequences of introduction of innovations, as well as eliminating restrictions through involvement of citizens.

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