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# The Importance of Institutional Support for Innovative Activities in the Digital Economy

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**Abstract:** The article is devoted to the institutional support of innovative activity in the digital age and the peculiarities of development regulation. It has been proven that the rapid development of technology and big data requires innovative policies, flexible governance and institutional changes. It was determined that the features of modern development require qualitatively new institutions to reduce the risks caused by digitalization, eliminate inequality, and strengthen control and accountability. Institutes must create the necessary conditions for monitoring and developing digitalization and supporting innovation. A qualitatively formed institutional environment will help to realize the advantages of the digital economy as efficiently as possible and make the EU an innovative leader in the world. The main areas in which institutional changes are primarily needed are considered: the labor market; education; enterprise management; investment activity. The symbiosis of the digital and green economy requires the formation of new markets and products, as well as business models at the enterprise level and the corresponding institutional environment. State institutions should not only promote the development of the knowledge economy and digitization, but also actively stimulate investment activity in new technologies and innovations. The main areas of investment stimulation are defined. The main changes in various sectors of the economy are outlined, which must be taken into account when building institutional support for innovative activities in the digital economy. The EU policy in the development of the digital economy and the achievement of sustainability has been thoroughly accelerated. The main directions of the development of innovative activities in the digital economy are determined.

**Keywords:** Digital Economy, Innovation, Innovation Policy, Institutional Support

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## 1. Introduction

The digital economy is an important driver of global economic growth and plays an essential role in achieving sustainable economic development. Due to rapid changes in the economy and digital transformation, there is a need to support and develop innovative activities on the part of the state, especially in the environmental sphere. The rapid development of technology and big data require policy innovation, flexible governance and institutional change. A qualitative leap in technological development for countries is impossible without political and institutional changes that will lead to the creation of a successful and sustainable digital economy [34].

Digital transformation requires the creation of a qualitatively new ICT (information and communications technology) infrastructure, which will allow the introduction

of the most effective technologies in the country and their implementation on the world market. But the creation of a new ICT infrastructure requires qualitatively new institutions to reduce the risks caused by digitalisation, eliminate inequality, and increase control and accountability. The institutes will create the necessary conditions for digitalisation monitoring and developing and innovation supporting in. A qualitatively formed institutional environment will help to implement the advantages of the digital economy and make the European Union (EU) an innovative leader in the world the most effectively.

An essential characteristic of the digital economy is innovation. The digital economy is becoming increasingly complex in the model of interaction between all participants, with a significant impact on the social sphere and the environment. Recently, the importance of innovation has been boosted due to the increase in digital developments and

the significant rise in technological competition between countries. The importance of supporting and developing innovative activities in the digital age will only grow, as intangible assets and data become increasingly important and valuable in the modern economic system [22].

States and international organisations face the ambitious task of creating a new policy and institutional environment for the digital age. Currently, the world is just forming a new digital culture, changing society and worldview, and with proper regulation of these processes, can lead to increased stability and democracy. All this stimulates the development of new management practices at the state and enterprise levels and requires the creation of new institutions as time demands.

Governments are required to manage the growing risks of digital data concentration, data security, and increasing of digital inequality. It is essential to maintain competition in the market of digital platforms and avoid its monopolisation. Therefore, digital transformation must be accompanied by simultaneous reforms and implementation of policies in all areas where digital technologies are used.

The article aims to identify the main challenges and ways of developing institutional support for innovative activities in the digital economy.

## 2. Materials and Methods

The principal methods used to investigate the significance of institutional support for innovative activities in the digital economy include the system method, the Agile methodology, and the synergistic method. The system method provides the concepts of "new institution in digital age" and achieving sustainable development, while the Agile methodology emphasizes adaptation to new conditions and flexibility of management structures to improve the effectiveness of the digital economy. The synergistic method proposes that different types of institutions can contribute to sustainable development and risk reduction through their respective functions and actions. These methods were developed through a literature review, statistical analysis, and identification of new contradictions, which led to the formation of practical recommendations for the establishment of institutional support for innovative activities in the digital economy. Over all more than thirty research articles and working papers were used in the article, including analytical reports and studies of international organizations. The study carries out a comparative analysis of institutional support for Innovative activities in different countries and in European Union.

## 3. Results and Discussion

The state and the institutions formed by playing a leading role in the development of the digital economy, especially in innovative sectors where, especially at the initial stages, a catalyst for development and proper regulation are needed. Proper institution-building leads to a sustainable digital economy. The digital economy is radically changing the relationship between people and the environment due to a

change in business paradigms. The development of a sustainable digital economy can solve environmental problems. The economy needs a new development model that can mitigate the negative consequences of digitalisation and open a new era of sustainable global development.

A highly competitive knowledge-based economy must be maintained and developed. A technological leap and further economic development is impossible without the right state policy and institutional reforms that support and develop the strengths of the digital economy [9].

The current institutional capacity of governments has limitations due to the lack of appropriate skills in the government for the rapid implementation of digital innovations in its activities, conflict of interests, low level of efficiency of certain vital institutions of the innovative development system, and others [32].

Consideration of the main areas in which institutional changes have the most significant impact on the development of innovations in the digital economy are most needed.

### 3.1. Labor Market

Digitisation is causing a significant polarisation of workplaces and changing labour institutions. The share of employment in high- and low-skilled occupations is increasing, while it is decreasing in medium-skilled occupations [32]. This polarisation of jobs will increase in the absence of effective public transition policies that can include opportunities for new skills. Of particular importance is the development and support of retraining and advanced training of employees for quick adaptation to new requirements. In the long term, digitalisation will create more jobs. Still, in the short and medium term, a significant reduction and increase in the unemployment rate are possible, which requires government intervention. Adaptability, empathy and leadership should be the core skills of workers [8]. Public labor institutes should provide reliable and at the same time flexible skills and create a favourable environment for dynamic active learning throughout life. Technological change accelerates the obsolescence of existing skills, and much of the future adjustment of skills must occur during working life [2]. Many governments already understand the importance of self-education and the formation of institutions for it, for example, in France in 2015 a system of "personal learning accounts" was introduced. When employees receive a certain number of hours of training entitlements per year, up to a maximum of 150 hours over a seven-year period. Digitisation and the circular economy are changing the structure of employment and creating new professions [18]. Labor institutes must undergo significant transformation. The appearance of utterly new labour contracts due to the specifics of the digital economy is predicted. On the other hand, support for the formation of databases based on digital data and contract platforms will allow real-time monitoring of employment dynamics and effective state employment policy. Investments in human capital, implementation of organisational changes, and innovation processes are necessary. These changes include fundamental changes in the skills, roles, norms and practices of leadership and management.

### 3.2. Education

The most important value for any country is human capital, qualified, ambitious and innovative people who develop the economy and the country. Development and training are the main conditions required by digitalisation, and the basic skills are technical and change management skills, lifelong learning, and digital literacy.

Social factors and culture also have a significant impact on digital transformation and the implementation of certain governance mechanisms. Human capital, engineering, and mathematics education (STEM) is especially important [21].

Human capital development tends to induce faster technology transfer, creating increasing returns to scale. Cross-industry convergence is taking place energetically, creating new markets. The rapid development of intelligent information technologies will increase the dependence on all spheres and their innovativeness [35].

Building a learning environment where people are conscious lifelong learners, eager to apply new ideas and explore different ways to do their jobs better is essential. The development and study of artificial intelligence in universities are especially important. Currently, there is a negative trend of artificial intelligence researchers moving from academia to industry, which is causing concern about brain drain. Many large technology companies have more resources to develop innovative artificial intelligence products than scientific institutes and universities. And every year this gap increases. This imbalance threatens the impossibility of effectively controlling and monitoring enterprises due to the technological gap between the regulator and enterprises, as well as between the private sector and academic sectors. It can be eliminated by increasing public-private partnerships and public orders.

A necessary condition is that education keeps pace with technological development, providing the necessary knowledge and skills for the digital age. More research on the impact of polytechnics on the labour market and digital development is also needed [27].

### 3.3. Enterprise

At the enterprise level, it is time to support innovative processes and flexible management structures by implementing change management practices, integrating change opportunities into management processes, and redesigning processes with the support of effective staff participation and feedback mechanisms with all counterparties.

Due to artificial intelligence and robotics, all tasks and processes can be solved quickly, but constant improvement of personnel skills is necessary. Data collection and digitalisation, artificial intelligence is very important for modern enterprises, because the more data a company can collect, the more opportunities to customise, improve the product and succeed in global markets.

The diffusion of technologies between enterprises should be faster, increasing innovativeness increases the productivity of enterprises. Creating an effective knowledge

transfer network is a critical task that accelerates innovation. Public institutions play an important role in supporting companies and innovators and in the transfer and diffusion of innovations.

### 3.4. Investments

Private investors often do not take into account the positive external effects of innovation. And often projects with high social value remain underfunded. The social return from R&D (Research and development) exceeds the private return, therefore attracting public investment and state support in some innovative areas is very important.

For the development of the innovative activity, it is necessary to have a developed financial sector and capital markets. Moreover, financing mechanisms can be different: loans, grants, equity capital, and others. Businesses are more likely to innovate and improve processes if there are ample opportunities for external financing.

States should continue to support efficient private markets and targeted public investments and develop a strategy for attracting private investments and stimulating innovation, grant funding. This is especially important at the pre-market stage. Consider the possibility of encouraging pension and insurance funds to invest in innovations, and improve the infrastructure of innovative financing.

There is a particularly large deficit of financing at the initial stages of startups since during this period that there is an urgent need for finance, which is difficult to attract. The high cost of risk assessment limits innovative companies' access to financing. The state needs to determine which strategic investments in innovative and transformative technologies are the main ones for future development and national security. Supporting investments in transformative technologies involves close coordination of all elements of the system, such as standards, infrastructure, joint investment, and financial institutions. Investing in artificial intelligence systems is especially important now. It is also important to support STEM, building human potential [28].

Private investments can help bring about transformations, and the state's goal is to reduce the risks of such investments in innovative projects by stimulating investments in innovations. Proper distribution of investments will contribute to fair and inclusive development. Improving connections and collaboration between digital and non-digital (business-to-business (B2B)) companies can accelerate the digital transformation of businesses, so it makes sense to develop and maintain strategic partnerships. Individualisation and provision of customised solutions from digital companies for small and medium-sized businesses is also a priority area.

Governments must accelerate innovation and catalyse funding and resources to promote digital innovation that accelerates environmental and social sustainability (sustainable digital e-commerce, climate-resilient SMART agriculture and autonomous digital solutions). To preserve resources, it is also advisable to develop platforms for sharing resources [22].

A separate task is the growth of investments in private

firms, which is complicated by the fact that the management is interested in obtaining profit in the short term and does not think about long-term strategies. It is necessary to combine ecological and commercial directions in activities. Such a symbiosis of the digital and green economy requires the formation of new markets and products, and business models at the enterprise level [9].

State institutions should not only contribute to the development of the knowledge economy and digitisation but also actively stimulate investment activity in new technologies and innovations. Stimulation of investments can be done by:

- a) Provision of state venture capital for early commercialisation of risky innovations;
- b) Ensuring development and compliance with laws on intellectual property;
- c) Tax support for investments in new developments and technologies;
- d) State procurement of new technologies;
- e) R&D support.

Comprehensive programs for the development of the digital economy should include ICT education, the spread of ICT among small and medium-sized enterprises, the development of science and innovation parks and incubators for ICT ecosystems, support for risk capital financing and incentives for early adopters of ICT, as well as the development of partnerships with business associations and transnational corporations [17].

Tools such as green bonds and blended finance will transform the value chain to deliver financial, environmental and social returns [31].

The implications of the transition to digital sustainability in banking and finance are a huge challenge for science. Therefore, it is also an important task to assess the new role of public finances in the digital transformation of the transformation and to predict future trends for the prevention of financial crises.

The state should help in the development of research works, testing of new platforms and technologies. Especially for the adaptation of new technologies and developments taking into account local characteristics and human capital.

Since the digital revolution is the fastest technological revolution, the market, people and infrastructure cannot adapt so quickly on their own and ensure effective activity without developed state and institutional support [26].

For such support, some countries introduce advisory councils. For example, the Australian Broadband Advisory

Council (ABAC) was created to provide advice on how to maximise the benefits of high-speed networks in key sectors of the economy. The government provides support for the deployment of 5G services, and supports private sector investment in 5G trials to promote and spread the technology [7].

Therefore, the digital economy can cause significant changes in various sectors of the economy, which must be taken into account when building institutional support for innovative activities in the digital economy:

- a) The growth of environmental risks due to the increase in consumption and production of digital goods, and the increase in the level of energy consumption due to cloud computing.
- b) Significant changes are expected in the social sphere, which will affect the employment structure of the population, the creation of new jobs, the movement of labor between sectors and the increase in the skills gap.
- c) The economic consequences of digitization are even more distortion of the market, and the growth of digital asymmetry between countries, the need for institutional support for small and medium-sized enterprises, support for startups in accessing and using digital data.
- d) The need to reduce the risk of monopolization of digital data by large players and support competition in the market.
- e) Ensuring data security and democratic processes.
- f) Determining the impact of digital finance on innovative development [26].

Therefore, new management approaches are needed to balance the potential benefits and risks of digitalization.

There are gaps in investment in early-stage innovation due to weak coordination between institutional investors and venture capital, and scaling up of innovative businesses needs to be addressed.

Norms, standards, the intellectual property system and other framework conditions have a significant impact on innovation. But this impact can vary across sectors and markets. It is necessary to increase the spread of knowledge and its absorption. The most favorable institutions for the development of innovations are in Singapore, Switzerland and Norway (table 1).

Future economic growth depends on the economy's ability to innovate and spread technology, which explains 44% of the difference in GDP per capita between countries. Therefore, the introduction and development of innovations are important for future economic development [28].

*Table 1. Global Innovation Index (GII) 2022 rankings by innovation pillar (Institutions).*

| Country              | Institutions | Human capital and research | Infrastructure |
|----------------------|--------------|----------------------------|----------------|
| Singapore            | 1            | 7                          | 11             |
| Switzerland          | 2            | 4                          | 4              |
| Norway               | 3            | 19                         | 2              |
| Netherlands          | 4            | 14                         | 14             |
| Luxembourg           | 5            | 32                         | 40             |
| United Arab Emirates | 6            | 17                         | 7              |
| New Zealand          | 7            | 18                         | 21             |

Source: Computed based on [16].

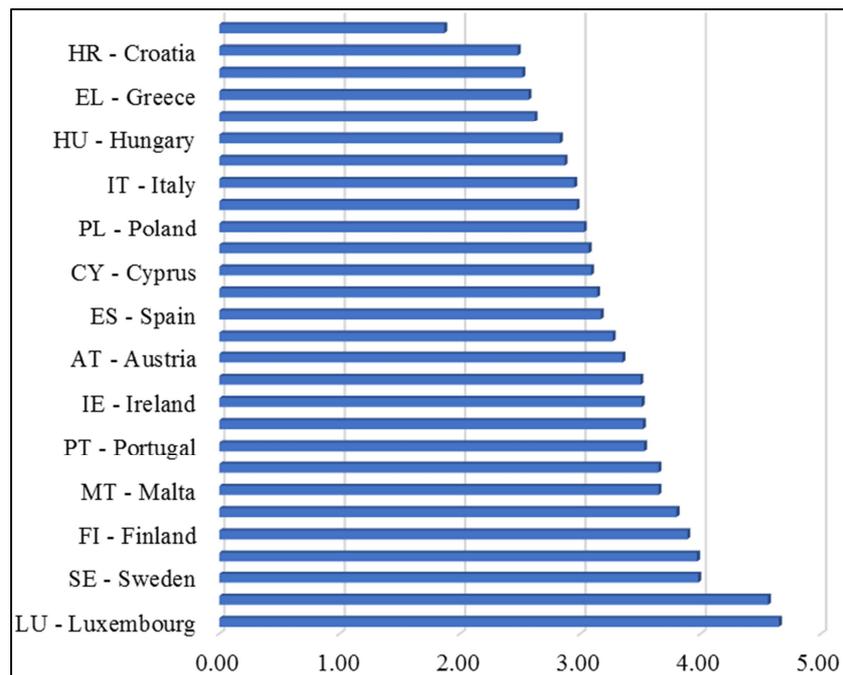
Institutions play a significant role in the formation of economies and are essential driving forces of economic transformations [1]. In our opinion, the approach of considering the change of institutions depending on their

interaction with digital technologies and digital transformation and information structure is interesting. The E-Government Development Index rating is given in Table 2.

*Table 2. E-Government Development Index (2022).*

| Country Name             | E-Government Rank | E-Government Index | E-Participation Index | Online Service Index | Human Capital Index | Telecommunication Infrastructure Index |
|--------------------------|-------------------|--------------------|-----------------------|----------------------|---------------------|--|
| Denmark                  | 1                 | 0.97170            | 0.88640               | 0.97970              | 0.95590             | 0.97950                                |
| Finland                  | 2                 | 0.95330            | 0.95450               | 0.98330              | 0.96400             | 0.91270                                |
| Republic of Korea        | 3                 | 0.95290            | 0.94320               | 0.98260              | 0.90870             | 0.96740                                |
| New Zealand              | 4                 | 0.94320            | 0.95450               | 0.95790              | 0.98230             | 0.88960                                |
| Iceland                  | 5                 | 0.94100            | 0.79550               | 0.88670              | 0.96570             | 0.97050                                |
| Sweden                   | 5                 | 0.94100            | 0.72730               | 0.90020              | 0.96490             | 0.95800                                |
| Australia                | 7                 | 0.94050            | 0.98860               | 0.93800              | 1.00000             | 0.88360                                |
| Estonia                  | 8                 | 0.93930            | 0.97730               | 1.00000              | 0.92310             | 0.89490                                |
| Netherlands              | 9                 | 0.93840            | 0.96590               | 0.90260              | 0.95060             | 0.96200                                |
| United States of America | 10                | 0.91510            | 0.90910               | 0.93040              | 0.92760             | 0.88740                                |
| United Kingdom           | 11                | 0.91380            | 0.95450               | 0.88590              | 0.93690             | 0.91860                                |
| Singapore                | 12                | 0.91330            | 0.97730               | 0.96200              | 0.90210             | 0.87580                                |
| United Arab Emirates     | 13                | 0.90100            | 0.78410               | 0.90140              | 0.87110             | 0.93060                                |
| Japan                    | 14                | 0.90020            | 1.00000               | 0.90940              | 0.87650             | 0.91470                                |
| Malta                    | 15                | 0.89430            | 0.76140               | 0.88490              | 0.87340             | 0.92450                                |
| Israel                   | 16                | 0.88850            | 0.71590               | 0.87450              | 0.89940             | 0.89150                                |
| Norway                   | 17                | 0.88790            | 0.69320               | 0.80070              | 0.95280             | 0.91020                                |
| Spain                    | 18                | 0.88420            | 0.75000               | 0.85590              | 0.90720             | 0.88950                                |

Source: Computed based on [30].



Source: Computed based on [10]

*Figure 1. Government procurement of advanced technology products (SD).*

The process of digital transformation and innovative activity, as a rule, occurs faster when the quality of institutions and management is high, therefore there is a positive relationship between the level of innovation and the quality of institutions and management [8].

A country or group of countries can establish a comprehensive coordination centre at the national level to

involve all stakeholders and protect national and consumer interests, promoting the development of broadband use. It is also appropriate to create an information exchange centre for successful projects and their evaluation. Support and development of infrastructure sharing can have a significant positive effect.

Public procurement of digital technologies and services

plays an important role in fostering competition and innovation among digital technology providers. Developed economies have used public procurement to promote open standards, best practices in ICT implementation and process reengineering, support and adoption of the latest technologies. Thus, public purchases and support of new technologies can be used in the development of smart cities, created smart infrastructure, efficient communal services, public services and others. Due to new technologies, public hearings can be available and provided at any time when the population needs it. Most state purchases of new technologies take place in Luxembourg, Sweden, and Finland (Figure 1).

The global management of the development and regulation of the digital economy is especially important in the modern period. For which it is necessary to form a new institutional structure. The existing institutional framework at the international level is no longer suitable for regulating and solving pressing issues and is no longer effective. It is expedient to create a new global institutional structure and multilateral interaction for the simultaneous management of data and new technologies.

Regulation of the digital economy and data in the EU takes place mostly in a reactive manner, and is aimed not at preventing problems, but at neutralizing them. At the same time, the European Union has a more integrated approach to different policies in the digital economy than the rest of the world [32].

For example, Council of Europe Convention 108 includes a forum where national governments, regulators and other interested parties can receive information and share views on the promotion and improvement of the Convention on the Protection and Transfer of Personal Data [5]. For the future protection of the control over the use of data, it is possible to develop special software to support the control and monitoring of the distribution of personal data.

In addition, The Renew Europe Group concluded an inter-institutional agreement with the EU secure connectivity program (IRIS), an ambitious plan for telecommunications satellites by 2027. This program should significantly increase the independence of the European Union and increase the synergism of the development of telecommunications services in the private sector and their development among private enterprises [24].

UNCTAD regulates digital development through research, consensus building and technical cooperation. For effective joint work, it is advisable to ensure effective links with other ongoing processes and initiatives, academic schools and the private sector. The developed "Roadmap for Digital Cooperation" emphasises the need to use data for development and the need for cooperation [29].

In addition, the United Nations Commission on Science and Technology for Development (CSTD) is an annual intergovernmental forum to discuss science, technology and development to develop policy recommendations and build consensus [6].

Thus, it can be argued that the increases in the use of new forms of data management due to the increase in interaction

between countries and data flows, these models are formed as models of distributed and polycentric data management. In addition, there is an increase in the importance of technology diplomacy, when governments pay attention to the level of technology and data ownership of a country when making decisions.

There are many organizations in the world that coordinate and evaluate digital development, but they often duplicate each other's functions, so there is a need to create a coordinating institution for comprehensive global management of digital data and innovative activities.

In recent years, the European Union has been trying to achieve digital sovereignty and reduce dependence on foreign technologies and foreign digital platforms. There is a need for the legislative introduction of the concept of "digital independence". Realization of the goal of digital independence can be solved with the help of the initiative of the governments of France and Germany, called Gaia-X. This is an initiative that develops a programmatic control and governance framework and implements a common set of policies and rules that apply to cloud technologies to achieve transparency, governability and interoperability. That will simplify the exchange of data between all participants and increase the level of trust and promote innovation [15]. This project seeks to build a unified data infrastructure for Europe based on open and compatible standards, which will contribute to the creation of a single data market in the European Union.

Various funds will be used to support innovations, which can be at both the national and international levels. Consideration of the main programs and funds that help to develop and spread innovations. The Digital Europe Program (DEP) will play a key role in the deployment and application of digital technologies and the promotion of supercomputing, AI, cybersecurity and digital skills [11].

The Recovery and Resilience Fund (RRF) plays an important role in aligning EU and national reform and investment priorities around a set of common goals. The NextGenerationEU fund with a total amount of more than 2 trillion euros [20]. In particular, the RRF regulation requires that each member state allocate at least 37% of the total allocation of its recovery and resilience plan to climate goals and 20% to digitalization goals. For the further growth of investments in these areas, it is advisable to improve fiscal and economic policies that will contribute to the digital green transformation [12].

European regulators must support openness in both software and hardware. Important pieces of legislation will be the Digital Services Act and the Digital Markets Act. This is a single set of new rules that will apply across the EU to create a safer and more open digital space. These pieces of legislation aim to promote innovation and digital security. The legislation will enter into force on January 1, 2024 [13].

The Coalition for Digital Environmental Sustainability (CODES) is an international alliance established in 2021 that offers a comprehensive and strategic approach to implementing sustainability in all aspects of digitalization,

identifying opportunities to reduce potential harm or risks from digitalization [3].

Combining digital data and modeling the development of events in various sectors is engaged in the Future Earth project, which develops a deeper understanding of complex systems and human dynamics with the help of artificial intelligence and modeling strategies for global sustainable development [14]. Also established is the International Scientific Council (ISC), which is a non-governmental organisation that brings together the scientific knowledge and resources needed to catalyse, incubate and coordinate effective international action [19]. Additional investment in shared data infrastructure can further expand new business models. Similarly, digital economy priorities are being developed under the new Connecting Europe Facility (CEF2) digital programme, which aims to support and stimulate investment in digital infrastructure [4].

Also important for determining priorities are the goals of the European Regional Development Fund (ERDF), in particular the goals of Smarter Europe — through innovation, digitalisation, economic transformation and support of small and medium-sized businesses in innovative activities.

The EU needs to develop monitoring mechanisms to assess the transition to sustainable digital business models and to evaluate the effectiveness of implemented measures and funds.

Diffusion of innovation is therefore a key challenge and depends on synergies between numerous organisations and programs (including HorizonEurope, Digital Europe, InvestEU, ETS Innovation Fund, DEP, CEF2 and ERDF, among others).

State institutions must change innovation models by creating sustainable prospects for digitalisation in scientific, research and research communities, and education; establish effective regulation and reforms that stimulate the mobilisation of digital innovation in support of sustainable solutions; stimulate markets and innovation processes through strategic planning by creating transformation roadmaps; investing in digital modernisation programs; supporting joint interaction of all participants [33].

Public administration should create an environment for the development of innovations, public administration itself also requires managerial and technological innovations. The implementation of flexible management at the state level (agile) will help to respond to changes quickly, develop innovations, increase the adaptability of the government, and provide an opportunity to experiment [32].

The interconnected nature and high degree of global interdependence of the digital economy determines the significant impact of national digital policy in one country, especially a digital leader, on others. In the absence of global governance of digital platforms, various negative consequences and the spread of development asymmetry are possible. To implement regulation and control in digital markets, it is necessary to have a high level of digital management and advanced artificial intelligence technologies. It is now very difficult for regulators to regulate, as

companies are often ahead of them in terms of technology. There is also a brain drain from academia to private companies.

It can be noted that the modern world economy has become dependent on Internet technologies. Therefore, the role and importance of the development of institutions that can regulate and control digitalization and ensure sustainable development is increasing. It is expedient for governments to have a holistic view of national digital transformation and consider it as a highly interactive ecosystem that requires a shared vision, flexible strategies, and institutional restructuring at both the state and international levels [25].

It is advisable to align industry policies with the strategy of digital development and reveal the full potential of digitalisation in sectors with the stimulation of innovative activity [17]. Also, develop a set of pro-innovation principles to guide regulation that will ensure that regulations do not hinder innovation.

It is also important to preserve and protect government data, which is more sensitive than other data, especially if it is part of critical national infrastructure. Therefore, they are subject to special regulations. When developing a strategy for the digital economy, it is necessary to define a broad exchange of data based on trust and security of use. And outline existing government data initiatives and opportunities for their harmonisation and optimisation to minimise the burden on stakeholders [7]. Building robust and reliable political frameworks and institutions is essential for future development. Public-private partnerships are an effective way to overcome barriers and improve the quality of digital public services [29]. The digital economy offers many options for economies to achieve more equitable growth and it is up to institutions to determine the direction and strategy for such development. The experience of some countries proves that a qualitative leap in technological development is impossible without political and institutional changes in the field of digitisation.

It is advisable to develop cooperation in interdisciplinary directions. Thus, for example, cooperation between natural scientists and engineers, on the one hand, and sociologists, on the other, is necessary to transform environmental and technical challenges into social challenges and actions. Therefore, now more than ever it is necessary to support and develop cooperation between different fields for convergence and achieving synergy. For the development of innovation, there must be flexible but stable institutions capable of managing transnational dynamics. Most countries have already formed a policy of digital economic development. Since the rapid development of the digital economy and the extent of its influence on other sectors has a huge level, it is becoming a key factor in changing the global economic structure and models of global competition. Digital transformation goals need to be promoted and articulated, combining new digital technologies with policy adjustments and flexible regulation that will foster innovation [23].

A successful transition to the digital economy depends on the established institutional and organizational factors and

opportunities for the formation of cross-sectorial policies, the development of a strategy for the financing of innovative activities, established incentives for enterprises, rapid adaptation of legislation and regulation to technological changes, and effective control measures. Innovations in the digital economy affect the rapid obsolescence of existing institutions and methods of regulation, which requires the introduction of flexible state regulation [22].

The sustainable development of the digital economy depends on the speed of innovation and adaptation, and establishes the connection between digital platforms and technologies. Therefore, digital adaptation in the economy as a whole is a factor of a sustainable digital economy.

For the development of innovative activities in the digital economy, it is advisable to:

- 1) develop mechanisms for promoting investments in ICT and the development of innovations in the digital sphere;
- 2) Create a favorable business environment to promote research and development;
- 3) Develop public-private partnership, form joint investment funds, develop ICT infrastructure;
- 4) To spread open source technologies that can be widely used in various fields;
- 5) Develop a transparent legislative framework in the field of research and development;
- 6) Encouraging the creation of a unified network, modular and intelligent production sector, the development of digital services and a digital state;
- 7) Establish policy and regulatory frameworks for such radical changes as the Internet of Things and the data economy;
- 8) Support for investments in digital platforms and human capital;
- 9) Development of a clear cyber security policy and dynamic management based on results and accountability;
- 10) Global data management, especially considering 5G and IoT (Internet of Things);
- 11) Formation of the architecture of digital cooperation and creation of synergy between bodies to respond to digital technologies.

## 4. Conclusion

The digital economy defines new economic, social and cultural realities and challenges. Virtual reality, artificial intelligence, deep learning, big data are increasingly used in the processes of planning and creation of development and management scenarios, improving the cognitive ability to understand the consequences of decisions and justifying decision-making.

The implementation of an innovative model of economic development is an indispensable requirement for ensuring sustainable development and necessitates the construction of effective institutional mechanisms for the development and reproduction of scientific and technical potential.

With developed institutions, new technologies develop and spread faster. It is advisable to gradually move from a consumption-based economy model to an economy based on innovation and digitalization. The convergence of digital technologies will undoubtedly significantly accelerate innovation activity. Which will promote cultural, institutional and behavioral innovations but realizing the positive features of digitalization requires a system-wide holistic approach with a special emphasis on education and human potential.

Thus, building a dynamic ecosystem of innovative activity in the digital economy requires an appropriate institutional environment and consistent strategies. Innovations in the digital economy should help in the rapid transformation to Industry 5.0. based on human capital, people-centeredness and sustainable development.

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