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The Influence of Intellectual and Innovative Determinants on the Development of Regions in the Conditions of COVID-19 and Global Digitalization

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ABSTRACT

The social challenges of modern globalization caused by the COVID-19 pandemic have led to significant changes in the development of economic systems at various levels. Social development in the direction of a post-industrial society activates the introduction of digital technologies in all areas of life, which requires paying attention not only to the innovative component of its development, but also to the intellectual one, since the digital transformation requires a constant updating of knowledge; this determines the purpose of this scientific study. The article aims to highlight the influence of intellectual and innovative determinants in the development of regions under current conditions, which are outlined by the manifestations of the COVID-19 pandemic and global digitalization in the development of economic systems. The foundation of the system approach methodology made it possible to distinguish the development trends of the regions in the conditions of the COVID-19 pandemic and global digitalization. It is proposed to create guidelines for the intellectual and innovative promotion, determinants of the development of the regions in the conditions of the COVID-19 pandemic and global digitalization, according to the socioeconomic, scientific-technological, organizational and legal components. The main guidelines of efforts to increase the role of intellectual and innovative determinants in the development of regional systems in the conditions of the COVID-19 pandemic and global digitalization have been tested, taking into account the principles of complexity, integrity, flexibility, efficiency and long term.

KEY WORDS: region, intellectual and innovative determinants, systemic approach, digital transformation, COVID-19, global digitalization.

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La Influencia de los determinantes intelectuales e innovadores sobre el desarrollo de las regiones en las condiciones de la COVID-19 y la digitalización global

RESUMEN

Los desafíos sociales de la globalización moderna causados por la pandemia de COVID-19 han llevado a cambios significativos en el desarrollo de los sistemas económicos en varios niveles. El desarrollo social en dirección a una sociedad posindustrial activa la introducción de las tecnologías digitales en todos los ámbitos de la vida, lo que exige poner la atención no solo en el componente innovador de su desarrollo, sino también en el intelectual, ya que la transformación digital exige una constante actualización del conocimiento; esto determina el propósito de este estudio científico. El artículo tiene como objetivo resaltar la influencia de determinantes intelectuales e innovadores en el desarrollo de las regiones en las condiciones actuales, que se perfilan por las manifestaciones de la pandemia de COVID-19 y la digitalización global en el desarrollo de los sistemas económicos. La fundamentación de la metodología del enfoque de sistema permitió distinguir las tendencias de desarrollo de las regiones en las condiciones de la pandemia de COVID-19 y la digitalización global. Se propone formar lineamientos para el fomento intelectual e innovador, determinantes del desarrollo de las regiones en las condiciones de la pandemia de COVID-19 y la digitalización global, de acuerdo con los componentes socioeconómico, científico-tecnológico, organizacional y legal. Se han probado los principales lineamientos de los esfuerzos para aumentar el papel de los determinantes intelectuales e innovadores en el desarrollo de los sistemas regionales en las condiciones de la pandemia de COVID-19 y la digitalización global, teniendo en cuenta los principios de complejidad, integridad, flexibilidad, eficiencia y largo plazo.

PALABRAS CLAVE: región, determinantes intelectuales e innovadores, enfoque sistémico, transformación digital, COVID-19, digitalización global.

Introduction

Innovative transformations, digitization and informatization of the world economy, as well as the current challenges of the COVID-19 pandemic lead to an increase in the influence and interest in intellectual and human capital. Under such conditions, the development of new concepts regarding the functioning of social and economic models with an emphasis on the evolutionary component in the description of modern phenomena and processes both at the level of the state and at the level of the region is taking place. Such transformations led to the emergence of a new model of the economy, which includes an

approach based on the use of human intellectual potential, digitalization and creative, innovative development. The phenomenon of such a new economy consists in a new concept of the relationship between the state, society, and science, which creates a new economic field that contributes to the further development of the country in a modern way, the formation of which is influenced by the modern challenges of COVID-19.

Today, the digital transformation of the economy is one of the innovative strategies of state and regional development, which is being studied in many countries. Therefore, the study of the influence of intellectual and innovative determinants on the development of regional economic systems in the conditions of COVID-19 and the formation of the digital economy is currently a poorly studied issue, which determines the relevance of the study.

The purpose of the research is to find out the basic conditions for identifying the impact of intellectual and innovative determinants on the regional development in the current conditions, which are outlined by the manifestations of the COVID-19 pandemic and global digitalization on the development of economic systems. To solve the outlined goals, the authors solved the following tasks:

- the relevance of this research is outlined, which is due to the modern challenges of the COVID-19 pandemic and global digitalization;
- justification of the research methodology of the influence of intellectual and innovative determinants on the regional development in the conditions of the COVID-19 pandemic and global digitalization;
- regional development trends in the conditions of the COVID-19 pandemic and global digitalization are highlighted;
- the formation of directions for the development of intellectual and innovative determinants of the regional development in the conditions of the COVID-19 pandemic and global digitalization in accordance with the socio-economic, scientific-technological, organizational and legal components of development is proposed;
- the main directions of efforts to increase the role of intellectual and innovative determinants in the development of regional systems in the conditions of the COVID-19 pandemic and global digitalization have been proven.

1. Literature Review

The European experience will prove that intellectual and innovative determinants have a fundamental influence on the regional development, these issues become especially relevant in the conditions of COVID-19 and global digitalization.

The authors of the article (Kurmanov N. et al., 2022) investigate the applied aspects of multifactorial analysis, which allows to identify patterns of innovative development of raw materials regions of Kazakhstan in connection with modernization transformations. Scientists have proven that the stimulation of innovative activity should be based on state policy measures, including: increasing investment in fixed capital; growth in gross regional product and spending on product and process innovation; regional development of information and communication technologies; increasing the share of R&D workers, etc.

The basis of the paper (Andriushchenko K. et al., 2022) is the development of tools for managing the innovative potential of the region based on the use of the mapping process. The authors proposed a scheme for forming a roadmap for the development of the innovation potential of the region, which includes a SWOT analysis of the development of the innovation potential of the region, as well as an algorithm for assessing the regional innovation potential.

Using the data of the Statistics Committee of the Ministry of National Economy of the Republic of Kazakhstan, the authors of the article (Sokira T. et al., 2021) analyzed and calculated the indicators of the innovative development of the regions. The authors note that, on the one hand, the dynamics of economic growth requires innovation, and on the other hand, innovation is the basis of increasing the competitiveness of the country and regions.

The scientists (Vakhovych I. et al., 2021) analyzed the international experience of intellectual specialization in the regions and developed proposals for its improvement. Based on the conducted studies of the European policy of unity and regional policy of the EU, the authors of the study proved the feasibility of introducing a model of smart specialization of regions to ensure sustainable regional development on an innovative basis and improve the living conditions of households.

The authors (Krasnostanova N. et al., 2021) are convinced that the main priority task of the regional policy aimed at increasing the competitiveness of the regions should be the development of their scientific, technical and innovative potential. According to scientists,

the existing approaches to the effectiveness of state strategic management tools for the innovative development of the country's regions need to be revised. As a conclusion, the authors have determined the priority directions for improving the tools for managing the innovative regional development, namely: the development of social consciousness, innovative and entrepreneurial culture; motivation of the population and entrepreneurship to active innovative activity; improvement of the content of specialized training of management personnel for innovative development; algorithmization of the activities of regional leaders in the management of regional innovative development.

The purpose of the scientific work (Popadynets N. et al., 2021) is to study the main trends in the development and management of eco-innovations in the EU countries and to analyze the role of environmentally friendly innovations for business and society. Based on the research, a conclusion was drawn regarding the growing role of eco-innovations in the competition between market entities and further improvement of the growth potential of the sector.

Within the scope of the article (Ključnikov A. et al., 2020), the potential of innovative regional development of a structurally unfavorable industrial region, focused on the steel and mining industry, is investigated. The authors offer innovative solutions and proposals for policymakers in the case of regional development of structurally disadvantaged industrial regions to overcome local currency barriers. As local currencies can be created in digital formats, scholars have highlighted the growing importance of local digital currencies during the COVID-19 pandemic.

Scientists (Khoreva V. et al., 2019) have researched that in parallel with the development of business, a scientific discussion about the digitalization of global talent management (GTM) has developed, focusing on specific aspects of digitalization. Within the scope of the study, scientists advance the scientific discovery to the empirical study of the impact of digitalization on GTM and analyze the comprehensive transformations of digitalization.

The article (Uzun T. et al., 2021) explores how the global pandemic has forced educational institutions around the world to adapt to a new, fully online concept of education and rapid digitization in order to continue providing their services to students. The authors analyzed the digitalization process of the Independent Learning Center (ILC)

and the Learning Advisory Program (LAP) unit at Yildirim Beyazit University in Ankara (AYBU), and proved that global digitization trends have a positive impact on regional development, namely in the part of the education system.

Drawing on crisis management and global value chain theory, the authors of the paper (Veglio V. et al., 2022) explore the relationship between digitalization, global value chain configurations, and coordination and governance mechanisms. According to the authors' research, the COVID-19 crisis accelerated the digital transformation of companies, even in sectors that were relatively less affected.

Considering the significant number of publications, the issue of modern problems and opportunities of innovative and intellectual activity and their impact on the development of regional economic systems in the conditions of covid 19 and global digitization requires further in-depth analysis and systematization.

2. Methodology

The methodology of the research object involves the application of a systematic approach to distinguishing the influence of intellectual and innovative determinants on the regional development in the conditions of the COVID-19 pandemic and global digitalization, since it is the systematic approach that makes it possible to investigate the multifaceted nature of the outlined processes and phenomena. Intellectual and innovative determinants from the point of view of a systemic approach are considered as a single object of scientific knowledge, and on the other hand as a subsystem of regions, the development of which is affected by the modern challenges of the COVID-19 pandemic and global digitalization. The system approach makes it possible to take into account the interaction and interdependence of multi-vector processes and reveal the overall result of the regional development under the influence of intellectual and innovative determinants as a synergistic effect, which is greater than the sum of individual effects.

3. Results

Modern globalization social challenges caused by the COVID-19 pandemic have led to significant changes both at the global level and at the level of the economies of individual regions and enterprises. Today, economic systems of all types rely on and expand their capabilities due to the introduction of digital and information and communication

technologies. In turn, the implementation of digital technologies in social development requires focusing attention not only on the innovative component of their development, but also on the intellectual component, since digital transformation requires constant updating of knowledge. The outline requires ensuring the foundations of the provision of fundamental knowledge and education, as well as the ability of intellectual capital to quickly increase their professional competences, acquire new knowledge and competences. This requires providing the opportunity and encouraging the continuous acquisition of new knowledge and new digital technologies. Today, in the conditions of global digitization, it is not the ability to process large masses of information, but to highlight the most important from it, which can bring a certain positive effect, that is becoming more and more relevant. That is, for the development of the intellectual potential of the regions in the current conditions of the COVID-19 pandemic and global digitalization, it is important to form the ability to adapt to changes, constantly acquire knowledge, and form cognitive abilities for the possibility of generating creative and innovative ideas.

Global digitization proves that intellectual capital is becoming the main driving force of regional development. The priority directions for the development of intellectual capital and its components must take into account the relevant specific characteristics of each direction and collectively contribute to the achievement of a specific result.

Modern globalization challenges caused by the COVID-19 pandemic and digitalization determine the following trends in the regional development:

- firstly, a significant compression of the innovation cycle, i.e. a reduction of the time between the generation of new knowledge, the creation of innovative technologies, goods and services and their obsolescence, which requires further scientific developments and their implementation;
- secondly, the blurring of disciplinary and branch boundaries in research and development in research and innovation production;
- thirdly, a significant increase in the volume of scientific and technical information, the emergence of radically new ways of working with it;
- fourthly, the growth of requirements for researchers and their competencies, due to rapid digital transformations and the development of digital technologies;
- fifthly, the growing influence of international standards in all spheres of social

development of the regions;

- sixthly, the formation of a regional economy of a closed cycle, which involves the non-linearity and closedness of the use of all natural and material resources necessary to ensure production and consumption with the provision of appropriate quality requirements and social accessibility developed using innovations and implemented thanks to digitalization.

In order to simplify the process of forming the directions of development of intellectual and innovative determinants of regions in the conditions of the COVID-19 pandemic and global digitalization, it is advisable to divide them into such blocks as: social-economic, scientific-technological, organizational-legal (Fig. 1).

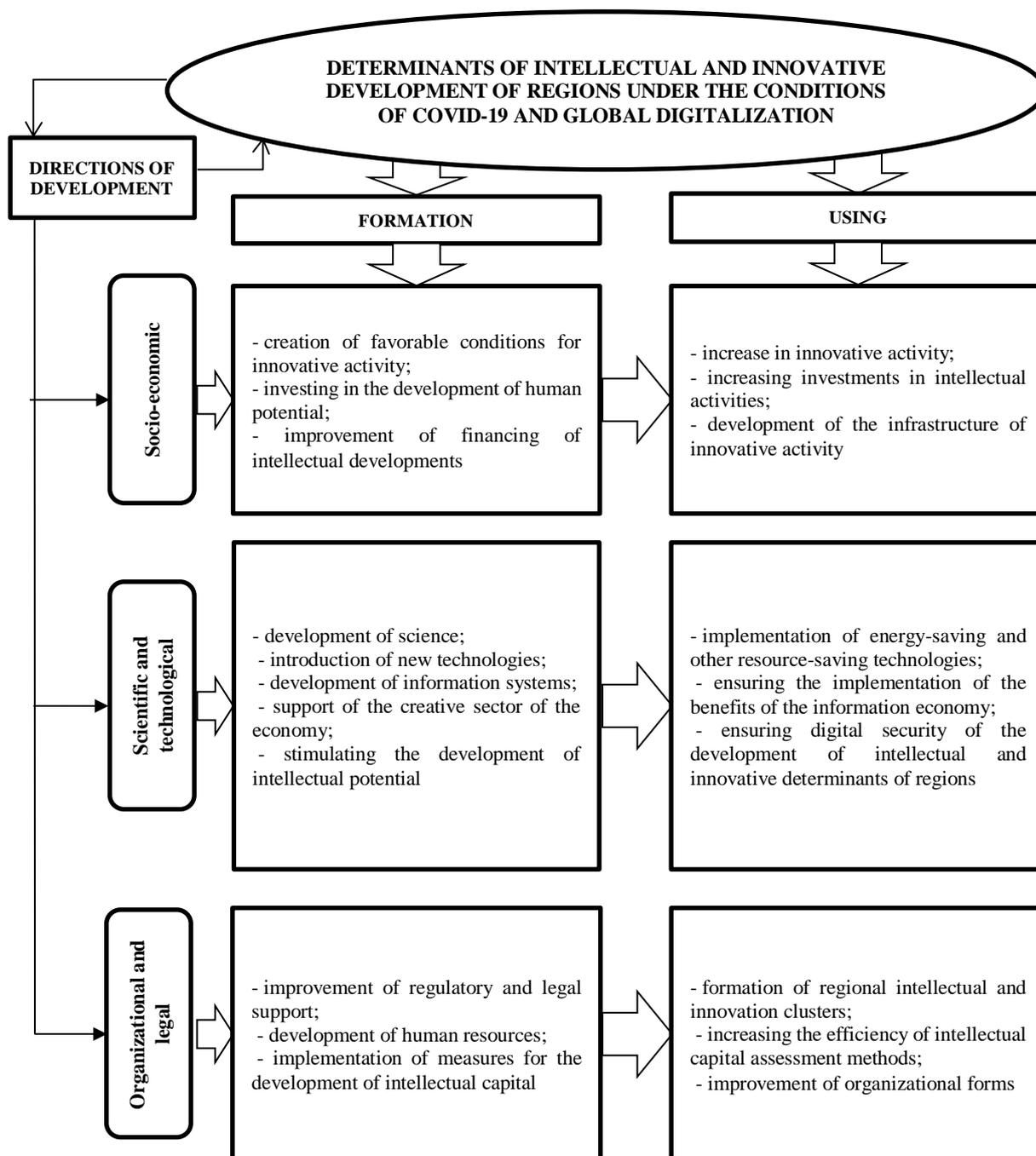
In the context of considering the development of the regional economy, it is appropriate to consider the essence of its intellectual and innovative direction as a set of accumulated abilities, knowledge, competences, intellectual resources that are capable of creating added value and contributing to the economic regional development due to the introduction of innovations and digital technologies. At the same time, the basis of intellectual capital is: human, organizational and social capital.

For the development of the intellectual and innovative direction in the system of regional development in the conditions of the COVID-19 pandemic and global digitalization, it is necessary to develop and implement appropriate measures that should be reflected in relevant strategies and programs.

What has been outlined makes it possible to note that the main directions for increasing the role of intellectual and innovative determinants in the development of regional systems in the conditions of the COVID-19 pandemic and global digitalization should be (Fig. 2):

- formation of relevant directions of the state strategy of intellectual and innovative development, which is based on the conceptual and methodological justification of the development of scientific and technical activity and the innovative direction of regional development. It is important to implement a system of intermediary organizations, which should be an institutional basis for building the overall regional potential based on the implementation of foreign experience on this issue;

Figure 1. Determinants of the intellectual and innovative regional development in the conditions of COVID-19 and global digitalization



Source: constructed by the authors

- improvement of institutional and legal support in matters of creating accountability and autonomy of relevant strategies and plans for the development of regional economic systems in the conditions of the COVID-19 pandemic and global digitalization. In order to update relevant strategies and plans, their flexibility and adaptability, it is necessary to

develop an appropriate monitoring and evaluation system;

- development and support of human resources for the formation of intellectual potential. It is necessary to create conditions under which the human factor will be developed, which will allow to expand the workforce in the relevant areas of development of the regions, due to the impact of the COVID-19 pandemic and global digitalization, taking into account the modern needs of the regional economy;

- formation of areas of financial support for the development of the intellectual and innovative component due to the attraction of state and private investors, creation of a positive investment climate, activation of the public-private partnership mechanism. It requires studying the experience of other countries in the development of innovative infrastructure, state support for reimbursement of costs, directions of cooperation between the public and private sectors of different countries;

- stimulating the development of scientific achievements and initiatives due to the competitive selection of projects, grant funding programs in accordance with the strategic directions of the development of regional economic systems;

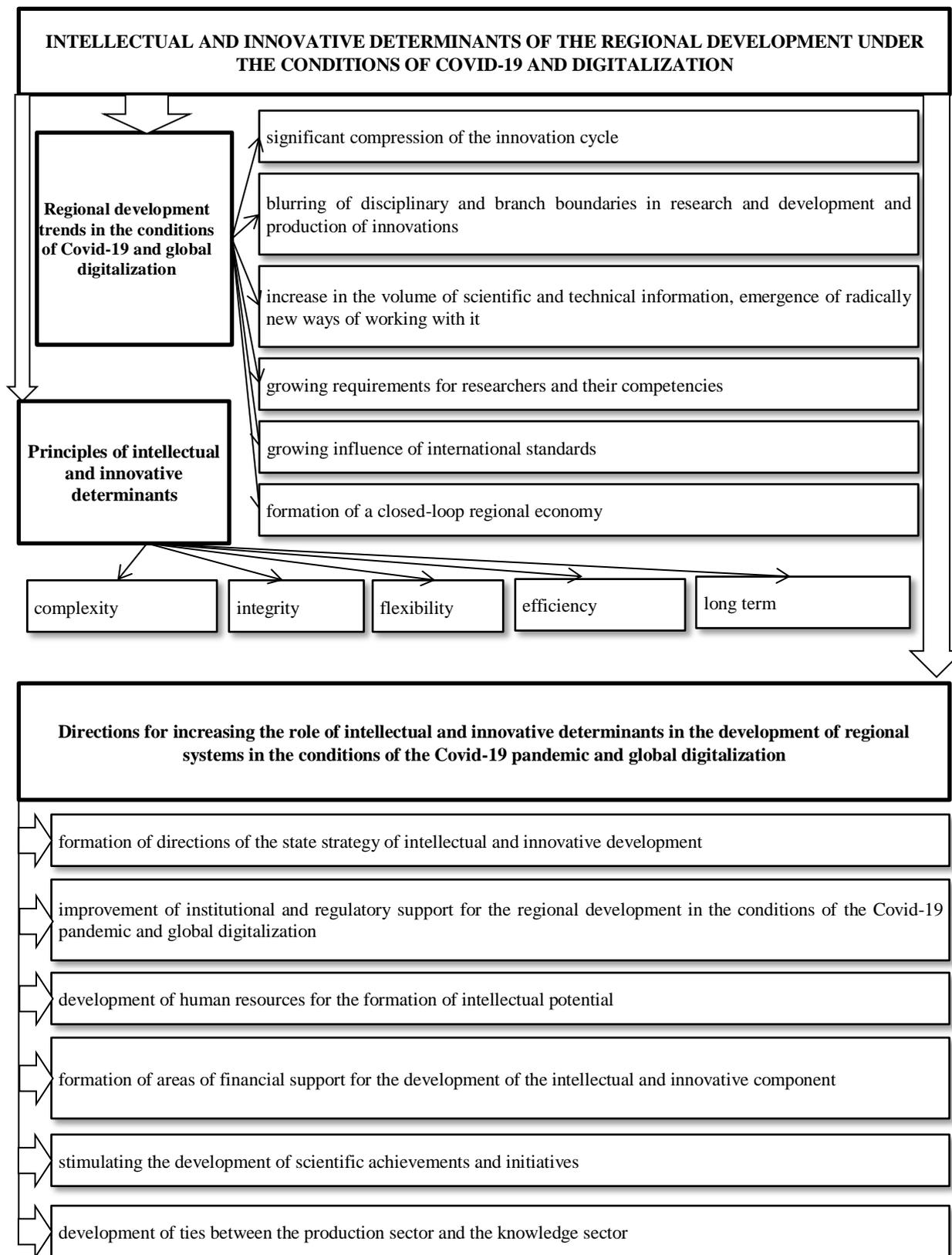
- the development of ties between the production sector and the knowledge sector, which contributes to the expansion of basic research and the formation of the basis of intellectual and innovative determinants.

Outlined directions for increasing the role of intellectual and innovative determinants in the development of regional systems in the conditions of the COVID-19 pandemic and global digitalization and the pre-grounded methodology of the system approach determines the selection of principles, the observance of which makes it possible to obtain a synergistic effect for the regional development in the conditions of the COVID-19 pandemic and global digitalization.

The principles of the role of intellectual and innovative determinants in the development of regional systems in the conditions of the COVID-19 pandemic and global digitalization include:

- the principle of complexity, which consists in the fact that both the intellectual and innovative components must develop comprehensively, since one is dependent on the other, this gives the opportunity to obtain a determining effect for the regional development in the conditions of the COVID-19 pandemic and global digitalization.

Figure 2. Directions for increasing the role of intellectual and innovative determinants in the development of regional systems in the conditions of the COVID-19 pandemic and global digitalization



Source: constructed by the authors

Complexity also implies proportionality and consistency of the interests of the subjects of regional economic systems, ensures the achievement of a balance of the interests of the subjects in the conditions of the COVID-19 pandemic and global digitalization;

- the principle of integrity, the task of developing intellectual and innovative determinants should be subordinated to the goals of regional and social development and contribute to the achievement of the set strategic tasks of the regional development in the conditions of the COVID-19 pandemic and global digitalization;

- the principle of flexibility, which is especially important in the conditions of the COVID-19 pandemic and global digitalization, which makes it possible to self-improve, change and adapt to levers of intellectual and innovative determinants under the influence of globalization changes that significantly affect the development of regional economic systems;

- the principle of effectiveness provides for the possibility of obtaining social, economic and other types of effect as a result of the development of intellectually innovative regions;

- the principle of long-termism, involves the development and implementation of permanent stimulating measures for the formation of the intellectual and innovative potential of regions, the use of digital technologies and the coordination of the goals of the development of determinants with strategic plans for the regional development and society as a whole.

Therefore, the selected principles and their observance make it possible to substantiate the trends of the influence of intellectual and innovative determinants in the direction of promoting the development of regional economic systems in the conditions of the COVID-19 pandemic and global digitalization, namely:

- changes in the labor market to meet the need for specialists who have more cognitive, adaptive, digital and creative skills that are in demand today;

- constant access to content and relevant information resources to increase the level of exchange and sale of creative ideas, innovative products and digital technologies;

- development of conditions for the emergence of new types of industries in the creative sector of regional economic systems under the influence of digitization and the introduction of innovative technologies;

- strengthening the protection of digital rights and digital data, which is due to the

increase in the impact of the development of digitalization in all aspects of the regional economy;

- the development of electronic commerce, which affects the scale of business in regional economic systems and ensuring the appropriate quality of public goods;
- implementation of innovative technologies in priority development areas in the conditions of the COVID-19 pandemic and global digitalization;
- support and development of business in the region based on the development of startup projects;
- establishment of closer interaction between international organizations, foundations and international partners in general.

Specific programs should be implemented in the regions, which take into account the specifics of a particular region and its features, which contributes to the formation of a unique ecosystem for the development of intellectual and innovative products. Positive trends can be ensured by observing the relevant principles regarding the development of the intellectual and innovative system of the regions, which will maximally take into account the relevant transformations of regional development in the conditions of the COVID-19 pandemic and global digitalization.

4. Discussion

Supporting the relevance of research by scientists (Yavorsky M.S., 2016) on the creation of effective public institutions based on the self-organization of professionals from various environments during a crisis and the role of regional information and innovation centers in initiating and supporting such processes, the presented practical experience of the Lviv State Center for Science, Innovation and IT Development in creating and support of public organizations in the scientific and innovative, business and educational spheres in Western Ukraine.

In our opinion, scientific works (Tulchynska S. et al., 2021; Khrushch N. et al., 2022, Popelo O. et al., 2022) that are devoted to the development of a methodical approach to the assessment and forecasting of the innovative regional development in the context of modern digitization trends, as well as to the study of trends and regularities of the influence of the realization of economic potential on the regional development deserve attention.

We support the results of the author's research (Martinidis G. et al., 2021) that

intellectual capital should be evaluated using indicators that measure various aspects of human and social capital. It is appropriate to prove the importance of intellectual capital for the production of innovations and research potential ways to achieve smart, sustainable and inclusive regional development.

Sharing the opinion of the authors (Ilić B. et al., 2016), it is appropriate to consider the appropriate level of intellectual capital as a key factor in the success of each region. The authors raise the problem of brain drain as a key contextual factor that affects the amount of intellectual capital and negatively affects the development of the region, thus pointing to the problems of the state policy of regional development.

Modern realities confirm that the acceleration and deepening of the digitalization of the economy is taking place in the conditions of the COVID-19 pandemic (Bilotserkivets V. et al., 2022). The authors argue that the COVID-19 pandemic has led to a change in the role of government in the economy and political implications for the digitalization of the economy.

We consider articles (Kholiavko N. et al., 2022; Tulchynska S. et al., 2021; Bazhenkov I. et al., 2021; Cosmulese C.G. et al., 2019; Djakona A. et al., 2020) devoted to the study of the functioning and development of the higher education system in the conditions of COVID-19 and taking into account the possibilities of digitalization to be extremely relevant.

Confirming the relevance of research (Asheim Bjørn Terje, 2019), it should be noted that smart specialization strategies are considered as a starting point and reference system for discussing innovation policy and regional innovation systems. The authors of the article prove that the approach to regional innovation systems, which represents a dynamic perspective of innovation and learning in promoting international competitiveness and economic growth, is a policy tool for the development and implementation of smart specialization strategies.

This proves the relevance of the study of the impact of intellectual and innovative determinants on the regional development in the conditions of COVID-19 and global digitalization.

Conclusion

As a result of the research, it is substantiated that the new vector of social development is focused on intellectual and innovative creativity and is aimed at directing all

components of the state system in the direction of shifting the emphasis towards creativity, creativity and innovative potential of society, which leads to corresponding transformations in the economic, social and cultural, political, scientific changes accompanying the process of transition to the principles and values of functioning of the digital economy in the conditions of COVID-19.

The scientific novelty of the study consists in substantiating the directions of development of intellectual and innovative determinants of regions in the conditions of the COVID-19 pandemic and global digitalization in accordance with the socio-economic, scientific-technological, organizational and legal components of development, taking into account the principles of complexity, integrity, flexibility, efficiency and long-term, which made it possible to substantiate the influence of determinants on the regional development.

Based on the conducted research, it was established that today the determinants of intellectual and innovative development in the conditions of the COVID-19 pandemic and global digitalization have a significant impact on the development of regional economic systems. Based on the creation of appropriate conditions for the promotion of intellectual development and the implementation of innovative developments on the basis of which additional value is created in the regions, it is possible to ensure their development and ensure the competitiveness of the regions in the conditions of the COVID-19 pandemic and global digitalization.

Further research in the field of identifying the influence of intellectual and innovative determinants on the regional development requires the development of directions for digital transformation in the conditions of the COVID-19 pandemic.

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