

## Brief information about the project

Name of the project	AP09057847 «Formation and development of knowledge economy in the conditions of digitalization of the Republic of Kazakhstan: conceptual foundations and implementation prospects»
Relevance	<p>Currently, humanity has entered a phase where knowledge becomes the key competitive advantage for individuals, organizations, and society. This necessitates a reevaluation of numerous rapidly evolving processes and the development of new effective measures. Furthermore, the aggregation of individual knowledge forms organizational knowledge, and the aggregation of individual and organizational knowledge forms societal knowledge. It becomes crucial not only to possess scientific knowledge, innovations, and information but also to commercialize and transform this knowledge into competitive products. Thus, the "knowledge economy" becomes a powerful impetus for accelerating technological development, increasing the knowledge intensity and competitiveness of products, promoting diversification of activities, aiding in overcoming depression, and boosting production in individual countries and regions.</p> <p>Many scholars have addressed the development of the knowledge economy; however, certain aspects remain unexplored. These include the concept of the knowledge economy, its manifestations and elements, new forms of production, insufficiently studied foreign experience in developing the knowledge economy and its adaptation to Kazakhstani realities, incomplete research on methods of state regulation of the knowledge economy and methodologies for measuring the knowledge economy, lack of a model of the knowledge economy in the conditions of digitalization, and the need to develop elements of the knowledge economy that contribute to ensuring economic growth and improving the quality of life in the Republic of Kazakhstan amidst digitalization and crisis. Thus, the relevance of the research topic, the lack of study of important questions, and the high demand for the knowledge economy for society predetermined the choice of the topic and the main directions of the research.</p>
Purpose	The objective of this work is to develop theoretical positions and practical recommendations for the formation and development of the knowledge economy in the conditions of digitalization and the coronavirus crisis to achieve sustainable economic growth and improve the quality of life in the Republic of Kazakhstan.
Objectives	<p>1. Summarize conceptual ideas about a knowledge-based society and, by analyzing the concepts of the knowledge economy, provide our own interpretation:</p> <ul style="list-style-type: none"> <li>- define the concept of the knowledge economy, its essence, and key characteristics,</li> <li>- explore the interconnectedness of information and knowledge categories; digitalization of the economy.</li> </ul> <p>2. Investigate the main directions and manifestations of the knowledge economy; new forms of production organization and management in the conditions of digitalization:</p> <ul style="list-style-type: none"> <li>- define the concept of the knowledge economy, its essence, and key characteristics.</li> </ul>

	<ul style="list-style-type: none"> <li>- examine the interconnectedness of information and knowledge categories; digitalization of the economy.</li> </ul> <p>3. Analyze the peculiarities of knowledge economy development in foreign countries in the conditions of digitalization:</p> <ul style="list-style-type: none"> <li>- study and systematize the experience of knowledge economy formation in foreign countries,</li> <li>- conduct a comparative analysis of the experience of knowledge economy development in foreign countries.</li> </ul> <p>4. Examine the peculiarities of forming and methods of state regulation of the "knowledge-based economy" in the Republic of Kazakhstan:</p> <ul style="list-style-type: none"> <li>- investigate the evolution of development and identify the main problems of knowledge economy formation in the Republic of Kazakhstan,</li> <li>- research the current state of state regulation of the knowledge economy, clarifying the roles of the government and business in gradually implementing knowledge economy elements into practice.</li> </ul> <p>5. Propose a system of economic instruments - measures of the knowledge economy in the conditions of digitalization:</p> <ul style="list-style-type: none"> <li>- thoroughly explore existing methodologies and systems for measuring the knowledge economy in the conditions of digitalization.</li> </ul> <p>6. Develop a model of the knowledge economy based on the application of digital technologies in the Republic of Kazakhstan:</p> <ul style="list-style-type: none"> <li>- explore existing models of the knowledge economy, identifying their shortcomings.</li> </ul> <p>7. Identify possible directions for improving the implementation of knowledge economy elements contributing to economic growth and improving the quality of life in the Republic of Kazakhstan in the conditions of digitalization and the coronavirus crisis:</p> <ul style="list-style-type: none"> <li>- develop corresponding technologies for information notification, collection, and processing, utilizing available digital platforms for society.</li> </ul>
<p>Expected and achieved results</p>	<p>Expected and Achieved Results:</p> <p>1. Conceptual ideas about a knowledge-based society were synthesized, and our own interpretation of the concept of the knowledge economy was provided through the study of a wide range of literary sources:</p> <ul style="list-style-type: none"> <li>- the concept of the knowledge economy, its essence, and key characteristics were defined,</li> </ul>

- the interrelationship between information and knowledge categories and the digitalization of the economy were examined.

2. New forms of production organization and management in the conditions of digitalization were proposed based on the study of the main directions and manifestations of the knowledge economy:

- literature sources from domestic and foreign authors on the issues of the knowledge economy were thoroughly studied,

- the main directions and manifestations of the knowledge economy were examined.

3. Based on the analysis of foreign experience, instruments of state support for the knowledge economy in foreign countries will be identified:

- the experience of the formation of the knowledge economy in foreign countries was studied and systematized,

- a comparative analysis of the development of the knowledge economy in foreign countries was conducted.

4. Directions and methods of state regulation of the knowledge economy in the Republic of Kazakhstan were proposed:

- the evolution of development was studied, and the main problems of forming the knowledge economy in the Republic of Kazakhstan were identified,

- the current state of state regulation of the knowledge economy was examined, clarifying the roles of the government and business in gradually implementing elements of the knowledge economy into practice.

5. A methodology for evaluating the knowledge economy in the conditions of digitalization was proposed:

- existing methodologies and systems for measuring the knowledge economy in the conditions of digitalization were thoroughly researched.

6. A model of the knowledge economy based on the application of digital technologies in the Republic of Kazakhstan was developed:

- corresponding technologies for information notification, collection, and processing were developed, utilizing available digital platforms for society.

Publication of Research Results:

During the project implementation period, 15 scientific works were published, including:

- 4 articles in journals recommended by the Committee for Quality Assurance of the Ministry of Science and Higher Education of the Republic of Kazakhstan,

	<ul style="list-style-type: none"> <li>- 3 articles in international peer-reviewed journals indexed in the Scopus database (percentiles 98%, 56%, 8%),</li> <li>- 3 book chapters in monographs indexed in the Scopus database (percentiles 49%, 10%),</li> <li>- 2 conference proceedings indexed in the Scopus database,</li> <li>- 3 abstracts at international conferences,</li> <li>- 4 author's certificates.</li> </ul> <p>Additionally, 4 acts of implementation of project results were obtained.</p>
<p>Research team members with their identifiers (Scopus Author ID, Researcher ID, ORCID, if available) and links to relevant profiles</p>	<p>Tovma Nataliya Aleksandrovna, Program Leader, PhD, c.e.s., Deputy Head of the Department of Business Technologies at Al-Farabi Kazakh National University, responsible for scientific and innovative activities and international relations. Hirsch index - 6 Scopus Author ID - 56530735400 ResearcherID - N-8698-2017 ORCID - 0000-0002-9114-6923 Scopus profile: <a href="https://www.scopus.com/authid/detail.uri?authorId=56530735400">https://www.scopus.com/authid/detail.uri?authorId=56530735400</a></p> <p>Isaias Bianchi, Senior Researcher, PhD, Associate Professor at the University of Santa Catarina (Florianopolis, Brazil). Hirsch index - 7 ORCID - 0000-0001-5480-0642 Scopus Author ID - 57014879700 Scopus profile: <a href="https://www.scopus.com/authid/detail.uri?authorId=57014879700">https://www.scopus.com/authid/detail.uri?authorId=57014879700</a></p> <p>Mishchenko Inna Vitalievna, Senior Researcher, c.e.s., Associate Professor at Altai State University (Russian Federation, Barnaul). Hirsch index - 2 Scopus ID - 57203264257 Scopus profile: <a href="https://www.scopus.com/authid/detail.uri?authorId=57203264257">https://www.scopus.com/authid/detail.uri?authorId=57203264257</a></p> <p>Tleppaev Arsen Moldagalievich, Senior Researcher, PhD, Associate Professor at the Kazakhstan-German University. Hirsch index - 5 <a href="https://orcid.org/0000-0001-9754-3383">https://orcid.org/0000-0001-9754-3383</a> Scopus Author ID - 57189999678 Scopus profile: <a href="https://www.scopus.com/authid/detail.uri?authorId=57189999678">https://www.scopus.com/authid/detail.uri?authorId=57189999678</a></p> <p>Shurenov Nursultan Beketovich, Senior Researcher, Senior Lecturer at the Department of Business Technologies at Al-Farabi Kazakh National University. Hirsch index - 2 ORCID - 0000-0003-2453-080X Scopus Author ID - 57211334673 Scopus profile: <a href="https://www.scopus.com/authid/detail.uri?authorId=57211334673">https://www.scopus.com/authid/detail.uri?authorId=57211334673</a></p>
<p>List of publications with links to them</p>	<p><b>Publications</b></p> <p><b>In journals recommended by the Committee for Quality Assurance in Science and Higher Education of the Ministry of Science and Higher Education of the Republic of Kazakhstan:</b></p> <p>1. I.V. Mishchenko, V.V. Mishchenko, I.S. Bianchi. Transition to a knowledge-based economy and high technologies during the pandemic: the experience of Russia</p>

// The journal of Economic Researcher and Business Administration No. 2, 2021. – Almaty, Kazakh University. P. 85-93.

<https://be.kaznu.kz/index.php/math/article/view/2331/2138>

DOI: <https://doi.org/10.26577/be.2021.v136.i2.09>

2. V.V. Mishchenko, I.V. Mishchenko. Young scientists in Russia in the transition to a knowledge-based economy // The journal of Economic Researcher and Business Administration No. 2 (140) 2022. P. 79-88.

<https://be.kaznu.kz/index.php/math/article/view/2488/2183>

DOI: <https://doi.org/10.26577/be.2022.v140.i2.08>

3. I. Mishchenko, V. Mishchenko. The healthcare system personnel provision as a prerequisite for the transition to the knowledge economy // The journal of Economic Researcher and Business Administration No. 1, 2023. P. 136-147.

<https://be.kaznu.kz/index.php/math/article/view/2641/2231>

DOI: <https://doi.org/10.26577/be.2023.v143.i1.011>

4. A. Nurgalieva, N.A. Tovma, I. Bianchi. Development of a knowledge economy model based on the application of digital technologies in the Republic of Kazakhstan // Bulletin of KarSU No. 3, 2023. P. 83-91.

<https://economy-vestnik.ksu.kz/index.php/economy-vestnik/article/view/641/576>

DOI: 10.31489/2023Ec3/83-91

#### **Articles in peer-reviewed scientific journals indexed in the Scopus database with a percentile of 35 and above:**

1. Suleyeva, K., Tovma, N., Zakirova, O. Developing emotional intelligence in elementary school children in Russia: verbal and non-verbal communication // Scopus - Education 3-13, 2021. Pages 1095-1106. Percentile -54.

<https://www.tandfonline.com/doi/full/10.1080/03004279.2021.1934060>

<https://doi.org/10.1080/03004279.2021.1934060>

2. Bianchi, I.S., Daehn, C.M., Dávila, G.A., Tovma, N., Shurenov, N. Massive Open Online Courses (MOOCs) as a driver to foster Knowledge in Higher Education Institutions // RISTI - Revista Iberica de Sistemas e Tecnologias de Informacao, 2022(48), P. 59-72. Percentile -8.

<https://scielo.pt/pdf/rist/n48/1646-9895-rist-48-59.pdf>

3. Ferreira, M.S., Antão, J., Pereira, R., ...Tovma, N., Shurenov, N. Improving real estate CRM user experience and satisfaction: A user-centered design approach // Journal of Open Innovation: Technology, Market, and Complexity, 2023, 9(2), 100076. P. 1- 10. Percentile 97.

<https://www.sciencedirect.com/science/article/pii/S2199853123001786>

#### **Chapters in books indexed in Scopus:**

1. Isaiás Scalabrin Bianchi, Nursultan Shurenov, Nataliya Tovma, Irina Maslova, and Ablai Khan Shansharkhanov. IT Governance Mechanisms to Foster Digital Transformation in Higher Education Institutions // "Studies in Systems, Decision and Control" Springer 2023. P. 79-99. Percentile 49.

[https://www.researchgate.net/publication/311583589\\_IT\\_Governance\\_Mechanisms\\_in\\_Higher\\_Education](https://www.researchgate.net/publication/311583589_IT_Governance_Mechanisms_in_Higher_Education)

2. Nataliya A. Tovma, Irina A. Maslova, Liudmila V. Popova, Ashirgul K. Seidildayeva, Inna V. Mishchenko. Possibilities and Threats of Digitalization for Society // Advances in Science, Technology and Innovation // Springer 2023. P. 47-49. Percentile 10

[https://link.springer.com/chapter/10.1007/978-3-031-34256-1\\_9](https://link.springer.com/chapter/10.1007/978-3-031-34256-1_9)

3. Tovma, N.A., Fernández-Plazaola, I., Popova, L.V., Aetdinova, R.R., Seidildayeva, A.K. Conceptual Fundamentals and Indicators of Knowledge Economy // Studies in Critical Social Sciences, 2023, 254, pp. 75–86. Percentile 10 <https://brill.com/display/book/9789004540019/BP000008.xml>  
DOI: [https://doi.org/10.1163/9789004540019\\_008](https://doi.org/10.1163/9789004540019_008)

**In international conferences:**

1. Angelina Beuzova, Natalya Tovma, Irina Maslova, Marina Vasileva, Inna Mishchenko and Nazym Tulebayeva. Internet marketing in the field of higher education // III International Scientific and Practical Conference “Modern Management Trends and the Digital Economy: from Regional Development to Global Economic Growth” (MTDE 2021) - Yekaterinburg, Russia, April 15-16, 2021. [https://www.shs-conferences.org/articles/shsconf/abs/2021/17/shsconf\\_mtde2021\\_03003/shsconf\\_mtde2021\\_03003.html](https://www.shs-conferences.org/articles/shsconf/abs/2021/17/shsconf_mtde2021_03003/shsconf_mtde2021_03003.html)  
<https://doi.org/10.1051/shsconf/202110603003>
2. Tovma N.A. Features of formation of knowledge economy in conditions of globalization // International Scientific and Methodological Conference "Financial Literacy in Labor Collectives, Entrepreneurial and Educational Environment: Global and Regional Trends and Tendencies." - Oryol, Russian Federation, 2021. P. 13-219.
3. Shurenov N. Smart city marketing on the example of Almaty. // International Scientific and Practical Conference "Prospects for the Development of the Digital Economy in Russia and Abroad". – Samara region, Tolyatti, 2021. P. 218-223.

**Implementation acts:**

- 1) The research results have been implemented in the educational process of the Peoples' Friendship University of Russia under the project within the framework of grant financing of scientific research by the Committee for Science of the Ministry of Science and Higher Education of the Republic of Kazakhstan on the topic: AP09057847 "Formation and development of a knowledge-based economy in the conditions of digitalization of the Republic of Kazakhstan: conceptual foundations and implementation prospects", Russian Federation, Moscow 2021.
- 2) The research results have been implemented in the educational process of the Polytechnic University of Valencia within the framework of grant financing of scientific research by the Committee for Science of the Ministry of Science and Higher Education of the Republic of Kazakhstan on the topic: AP09057847 "Formation and development of a knowledge-based economy in the conditions of digitalization of the Republic of Kazakhstan: conceptual foundations and implementation prospects", Valencia, Spain, 2022.
- 3) The research results have been implemented into the educational process of the Peoples' Friendship University of Russia under the project as part of grant financing for scientific research by the Committee for Science of the Ministry of Science and Higher Education of the Republic of Kazakhstan on the topic: AP09057847 "Formation and development of a knowledge-based economy in the conditions of digitalization of the Republic of Kazakhstan: conceptual foundations and implementation prospects," Russian Federation, Moscow, 2023.
- 4) The research results, particularly the knowledge economy model, have been implemented into the educational process of Marmara University under the project AP09057847 "Formation and development of a knowledge-based economy in the

	conditions of digitalization of the Republic of Kazakhstan: conceptual foundations and implementation prospects," Turkey, Istanbul, 2023.
Patents	<ol style="list-style-type: none"> <li>1. Tovma N.A. Certificate of state registration of rights to copyright object "Knowledge economy" No. 18649 dated June 11, 2021, issued by the National Institute of Intellectual Property of the Republic of Kazakhstan.</li> <li>2. Tovma N.A. Certificate of state registration of rights to copyright object "Conceptual representations of a knowledge-based society" No. 30215 dated November 11, 2022, issued by the National Institute of Intellectual Property of the Republic of Kazakhstan.</li> <li>3. Tovma N.A. Certificate of state registration of rights to copyright object "Knowledge and intellectual capital in a knowledge-based economy" No. 30104 dated November 8, 2022, issued by the National Institute of Intellectual Property of the Republic of Kazakhstan.</li> <li>4. Tovma N.A. Certificate of state registration of rights to copyright object "Development of education and science in transition to a knowledge-based economy and the formation of a super-intelligent society – 5.0". No. 30028 dated November 7, 2022, issued by the National Institute of Intellectual Property of the Republic of Kazakhstan.</li> </ol>