



## Prognosis assessment of the role of digital platforms in providing the internationalization of the knowledge economy

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**Abstract:** The study aims to assess and predict the quantitative and qualitative characteristics of the impact of digital platforms on the internationalization of technology transfer and the knowledge economy in general. The study's theoretical basis is the methodology of integrated assessment of the functioning of the international platform Enterprise Europe Network which is a component of the macroeconomic system in its classical sense. The multifactor analysis provides a predictive assessment of the role of digital platforms in the knowledge economy's internationalization process and outlines typical scenarios for the formation of an innovative paradigm for managing the internationalization of technology transfer. The integral value of the index of the impact of digital platforms on the process of internationalization of the knowledge economy was obtained, which allowed the separation of an innovation cluster to enhance technology transfer in three countries: Great Britain, Poland and Ukraine, i.e., the countries with high correlations of knowledge economy activation. The binary influence of the Covid-19 pandemic on the development of high-tech solutions in the knowledge economy is proven.

### Introduction

In current conditions, the process of internationalization and digitalization of the knowledge economy has started playing a very important role. It determines the competitive position of some countries in the world arena and makes it possible to stimulate economic development. The development of humanity is accompanied by the growth of a knowledge-based society and a digital economy. The countries that can timely and accurately predict the directions of intensification of technology transfer on a commercial basis become the world leaders and the countries that are unable to do so remain behind. The lag between the first and the second grows rapidly as the internationalization of technology

transfer is a strategically important factor in the process of implementing modern approaches in the development of the knowledge economy. Thanks to technology transfer, innovations are spreading in all spheres of the economy, in particular, the economy is becoming more "digital", which is seen in the Digital Agenda of Ukraine - 2020. In this context, it is worth actively using special digital platforms, among which the EEN network can be considered the most effective because it intensifies the process of technology transfer and interaction among the economic entities in Europe. It should be recognized that digital platforms systematically complement the national economic system and become its integrated component.



In recent years, researchers worldwide have increasingly focused their efforts on the process of knowledge transfer, which takes place in the context of the formation of specialized transnational networks (Hilmerssona and Hilmerssonb, 2021; Marchioria and Francob, 2020). The research by Hilmerssona and Hilmerssonb, 2021 showed that small and medium-sized firms with limited resources need to develop their dynamic capabilities and accumulate networks in the changing market environment. Information about the latest technological solutions can play a key role in the development of such innovative firms. According to Stepanova et al., 2019, the international Enterprise Europe Network can be considered one of the main networks of such kind. In this context, Polish researchers Dorozynski et al., 2015 argue that forecasting internationalization in the economic systems of separate countries will allow optimizing macroeconomic processes on an unprecedented scale, but this can also lead to increased knowledge and technological competition at the national and international levels.

Demirbag et al. (2021) and Orero-Blato et al. (2020) draw attention to the fact that the lack of trust and clear, effective recommendations, as well as the confidentiality character of technologies that are transferred on a commercial basis, make the internationalization of technology transfer in the transnational space a serious challenge for countries in terms of competitiveness and cybersecurity in the context of deepening the digitization of all global processes. In this dimension, technology transfer is a strategically important component of the overall economic process based on producing and commercializing new knowledge and technologies. Thanks to the effective implementation of the mechanism of international technology transfer, digital development processes can be intensified, and a country capable of intensifying these processes gains additional competitive advantages in the world (Alekseieva et al., 2021). Efficient technology transfer accelerates regional, national and transnational digital processes and activates the knowledge economy. However, in wartime conditions in Ukraine, state business support programs are crucial for the development of the country (Alekseieva et al., 2023).

It should be noted that technology transfer plays a key role in ensuring the internationalization of the innovation economy (Karlsson et al., 2015). At the same time, the process of globalization of the economy creates conditions for forecasting international technology transfer. In particular, the creation of institutional support, special infrastructure, stimulation of

technological cooperation of business representatives, etc. The economic system in the conditions of digitalization is a partnership of organizations that provide constant interaction of technological platforms, applied Internet services, information systems of public authorities, systems of analysts, organizations and citizens.

Today one of the priority strategic directions for the development of international technology transfer is the digital platform, which functions as a technological basis for providing a range of new, specific services related to digital processes (Chung and Ho, 2021). A digital platform providing technology transfer is a specific communication and transactional environment where the participants benefit from interacting. In the traditional macroeconomic sense, economic entities are divided into three groups: entrepreneurs, consumers and the state. In the digital economy, all these entities remain unchanged. Still, the way of doing business, the role of entities and nature, and their interactions tend to suffer radical changes, and the nature of their interaction also becomes different (Vătămănescu et al., 2019). To some extent, technology transfer can be considered a form of such interaction in new conditions, i.e., technology transfer accelerates other operations (credit, rent, purchase and sale, taxes, payments, etc.), reduces or even removes barriers to access to new technologies; provides competitive advantages to the business aimed at digitalization; provides the opportunity to create an effect of scale and realize its positive benefits while reducing costs.

The process of effective globalization of national economies based on parity competitive positions is possible under the condition of strategically justified internationalization of technology transfer. Technology transfer in the transnational space is becoming increasingly important because new knowledge and technology are major drivers of global economic growth. The interaction among economic entities (consumers, entrepreneurs and the state) is ensured thanks to the technology transfer. Researchers have been stating for a long time the fact that the processes of creating a society based on knowledge and its further development should be analyzed and evaluated in the context of globalization and internationalization, as well as in the context of the processes of global economic development (Karlsson et al., 2015; Melnikas, 2011; Santos et al., 2021). Today the production and dissemination of knowledge in the global space accelerate the development of tools for transnational academic mobility (Jöns, 2007).

Based on the analysis of the nature of cooperation between Canadian subsidiaries and Chinese companies, Li and Vonortas, 2021 in their study they identified four strategies of internationalization of knowledge and their spatial configurations according to the direction of knowledge flows and ways of interconnection, i.e., knowledge, replication, search, connection and integration. De Moortel and Crispeels, 2018 note that in China, international technology transfer from universities to business is based on informal institutional links (mutual trust towards different official arrangements), which gives flexibility to the innovative business, while the clear formalization of the process characterizes the commercialization of Western technologies in a global market environment. In general, this allows organizing the process of joint learning but requires higher management costs. Aggarwal and Kapoor., 2021 emphasize the important strategic role of increasing the dynamics of intercultural business relations, which will increase technological efficiency to achieve sustainable competitiveness of innovative companies in particular and the knowledge economy in general. Britto et al., 2021 consider the formation of networks of international knowledge flows. These changes are related to the internationalization of science and, as a result, the formation of another network of international knowledge flows. Both networks, i.e., one run by a firm and the other run by a university, can be driven by revolutions in information and communication technologies. The combination, overlap and interweaving of these two networks of international knowledge flows create a new level in innovation systems that is a new global innovation system.

However, the scientific literature still does not highlight the importance and relevance of the prognosis of the role of digital platforms in the internationalization of technology transfer in the knowledge economy activation, in particular, using the example of the digital platform Enterprise Europe Network, which can help to forecast the decisive changes in the domestic and global economy. Also, despite the value of research, some methodological aspects of the internationalization of technology transfer in the context of the intensification of the knowledge economy have remained out of the attention of scientists.

The research aims to assess and predict the quantitative and qualitative characteristics of the impact of digital platforms on the internationalization of technology transfer and the knowledge economy in general.

Taking into consideration the stated aim of the study, it is necessary to determine the following tasks of the research:

- To determine the ability to provide internationalization of technology transfer as the main factor of the competitiveness of the country in the world arena;
- To predict the distribution of the profiles published in EEN by areas: smart city, Internet of things, artificial intelligence, blockchain, cybersecurity, Industry 4.0;
- to define the essence of technology transfer and distinguish it from other similar terms used in the scientific literature and to present forms of technology transfer in modern conditions;
- to carry out the multifactor analysis of data on the digital platform Enterprise Europe Network (EEN) functioning in the context of determining the impact of such platforms on internationalization of technology transfer and reduction of the costs for the IT implementation.

Thus, based on the literature review, the following hypothesis has been stated:

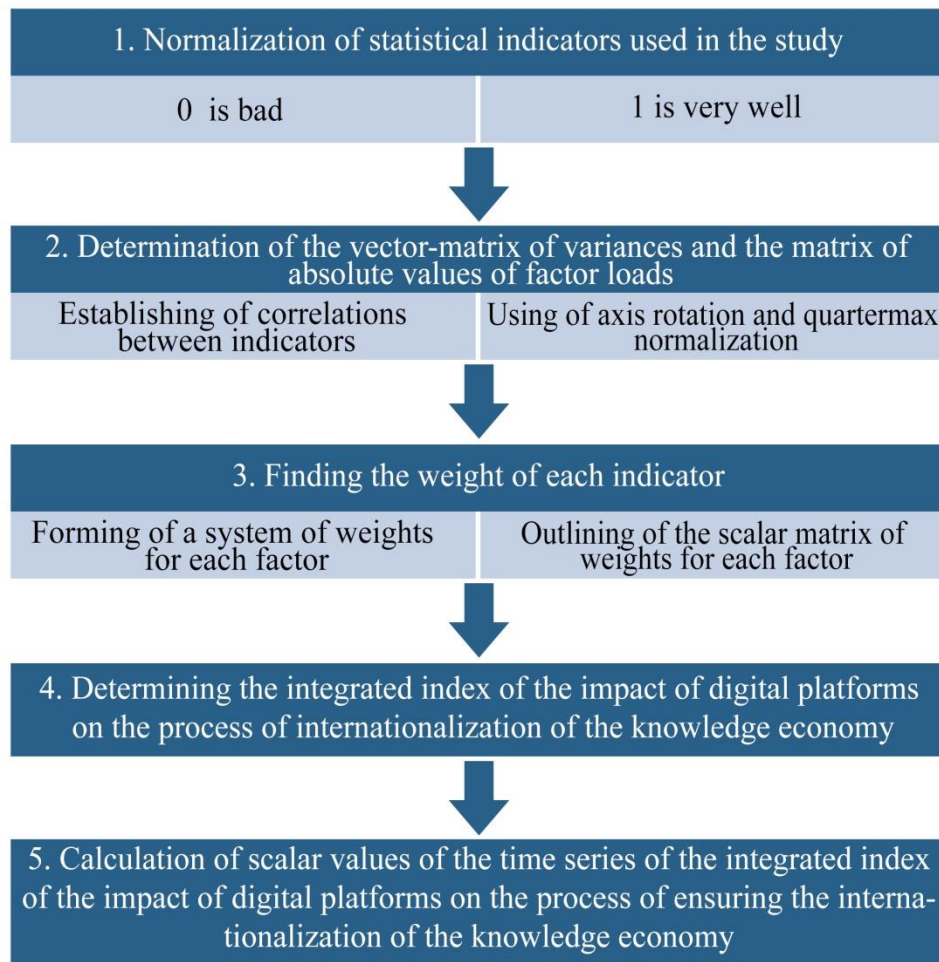
H1. The role of digital platforms in the process of technology transfer in the transnational space in modern conditions is becoming increasingly important and can be characterized by a single integrated indicator that simplifies visualization and improves forecasting of the knowledge economy in the context of internationalization.

H.2. The ability of national economies to integrate and choose effective strategies for internationalization of technology transfer will determine the competitive niche of their countries in the world arena, whereas the gap between technologically advanced countries and others will grow every year.

H.3. The Covid-19 pandemic will negatively affect the dynamics of high-tech solutions in the knowledge economy, but the processes of internationalization and digitalization are laying a new foundation in business and everyday life.

## Methodology

The research model of this study is based on the methodology of integrated assessment and presented as an adapted algorithm by Zalizko et al., 2020 to assess and forecast the dynamics of the integrated index of the impact of digital platforms (on the example of EEN) on the providing of internationalization of knowledge economy (Fig. 1).



**Figure 1. Algorithm for estimating the integrated index of the impact of digital**

To achieve this goal, it was not managed to conduct a survey among the full range of the enterprises-users in correspondence to the purpose determination of the «knowledge economy», but this long-term task remains relevant. It will be possibly accomplished by implementing future projects with Horizon Europe or National Research Fund of Ukraine. That is why presently we will limit the study of the sample data to the following areas: smart city, Internet of things, artificial intelligence, blockchain, cybersecurity and integrated industry development 4.0.

Nowadays, the dynamic, sustainable development of the transnational economic systems, through the internationalization of knowledge and technologies, accompanied by digital transformation, is the fundamental basis for increasing the country's competitiveness in the international arena and the quality of life of its citizens. The country's lagging in the growth rates of goods and services produced and provided with the help of new technological solutions (new goods and services possessing high added value) automatically causes its lag in all industries (Qamruzzaman et al., 2021). At the same time, raising the diversity and volume of profits from international technology transfer in the

structure of national production is the fundamental basis for increasing the country's competitiveness in the international arena and the quality of life of its citizens. Thus, a new reality has developed in the world, which prompts governments of all countries to pursue a policy of strategic development of innovative economy and internationalization of knowledge and technology on a commercial basis (Melnikas, 2011).

The stated above allows us to build various organizational forms of international technology transfer in frames of the technology transfer model. Currently, the most common organizational forms are such forms as joint research complexes, companies created for technology transfer and techno starters, Memoranda of understanding and joint research projects (Fig. 2).

In conditions of digitalization of the economy, virtual organizational forms of technology transfer and the ways of spreading information about the technology transfer via the exchange of knowledge among people involved in research become even more important. The key concept in the new economic reality is creating a "digital platform" that can be used for technology transfer. In this regard, it is not surprising that as part of the transition to the digital economy today, a lot of attention is paid to

Joint research complexes	Associations	Companies created for transfer of technologies and technostarters	Memorandums of mutual understanding and research contracts	Joint research projects
<ul style="list-style-type: none"> <li>Joint research complexes can be real physical structures or virtual centers.</li> <li>They include research institutes, companies and government agencies</li> </ul>	<ul style="list-style-type: none"> <li>Associations representing the interests of many small innovative firms and institutions as users of new technologies or as suppliers of high technologies.</li> </ul>	<ul style="list-style-type: none"> <li>Subsidiaries (spinoffs) are often supported by the parent organization in a number of ways, including special rights for developed technology, office and productio, space, investment capital, research support, etc.</li> </ul>	<ul style="list-style-type: none"> <li>Organization of joint research projects should include three processes: acquisition of technology, technology development and technology transfer</li> </ul>	<ul style="list-style-type: none"> <li>A Memorandum of Understanding is usually an informal, non-legally binding agreement, which sets out the basic rules for cooperation between partners.</li> <li>It is often used as a first step to reaching deeper agreements on the transfer technologies or contract research</li> </ul>

**Figure 2. Organizational forms of international technology transfer**

"digital platforms" and the active use of this transformational tool, including the development of the technology transfer process. Chung and Ho (2021) state that implementation of the process of international technology transfer in conditions of activation of the knowledge economy is possible through the successful functioning of at least ten digital platforms for the main subject areas of the economy, including digital healthcare, digital education, smart city, digital agriculture etc. It is necessary to remember that people remain the main carriers of knowledge and ideas on new technologies. That is why the role of qualified staff possessing some special unique skills is crucial for technology transfer in conditions of digitalization.

digital platform for the internationalization of innovative business and is currently admitted in 68 countries. It brings together more than 3,000 experts and more than 600 member organizations, including chambers of commerce and industry; technological platforms; innovation support organizations; universities and research institutes; regional development organizations. The network's customers are currently more than 3 million companies that are anxious to develop their business outside their country. To implement the tasks of the network, such tools are used for the organization and holding of various international events (Brokerage Events, Company Missions, Conferences / Seminars / Information Days, Fairs / Exhibitions, Sector Group

Staff Staff exchange	Knowledge centers	Agreements Agreements of use research	"Sowing" financing	Spread Spread of information
<ul style="list-style-type: none"> <li>It is an important mechanism in the process of transfer of technologies.</li> <li>It can take many different forms -such as joint appointments, missions, visits of scientists, etc.</li> </ul>	<ul style="list-style-type: none"> <li>Virtual organizations designed to collect experience and knowledge from different branches of science, and organization for the development or commercialization of a new technologies.</li> </ul>	<ul style="list-style-type: none"> <li>These agreements allow companies or universities to gain access to research laboratories of institutes, determining the conditions and objectives of such use.</li> </ul>	<ul style="list-style-type: none"> <li>Small funding for innovative research and technology transfer activities with other organizations</li> </ul>	<ul style="list-style-type: none"> <li>Providing of different types of information about the results of research and development and technology transfer to customers,</li> <li>using all modern means of distribution of information about new technologies</li> </ul>

**Figure 3. Organizational forms of international technology transfer in conditions of digitalization**

In practice, the key point in the study of the possibility of successful implementation of the internationalization of technology transfer is the preliminary effective marketing research of relevant segments of the innovation market (Yindan et al., 2019).

**Results**

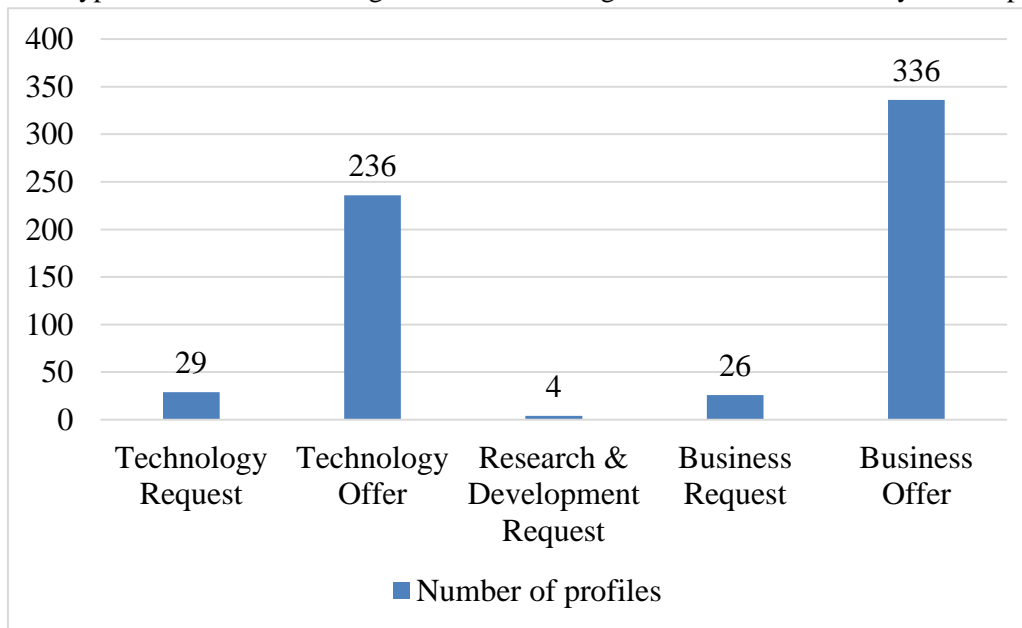
Such exploring can be done with the help of modern digital tools of the specialized international information and communication networks of technology transfer and the Enterprise Europe Network (EEN). The European Commission has identified the EEN network as a key

Meetings, Training, Working Group Meetings, Workshops) in various areas of international business currently taking place in the world. There should also be mentioned as such an effective tool of involvement in international events as the presentation of anonymous profiles through business and technology proposals and requests (Technology Request, Technology Offer, Research & Development Request, Business Request, Business Offer) on the electronic platform of the network. Analysis of data from the calendar of events of the Enterprise Europe Network for 2020 compared to 2019 is conducted in the article (Alekseieva et al., 2021).

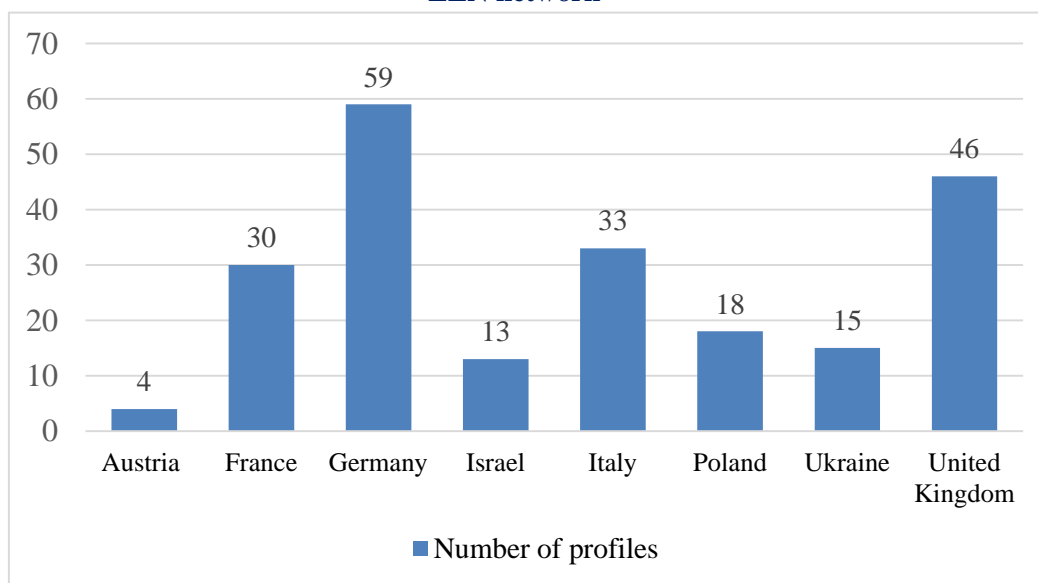
A visual example of using the searching system to create EEN profiles in the direction of information and communication technologies (ICT). The process of searching on the platform is fulfilled by using keywords and selecting profile types and countries of origin.

characteristics of the impact of digital platforms on the internationalization of technology transfer and the knowledge economy in general, we highlight the offers and requests for individual countries (Fig. 5).

Figure 5. shows the activity of companies around the



**Figure 4. Quantitative distribution of profiles by functional types according to the keyword "ICT" in the EEN network**



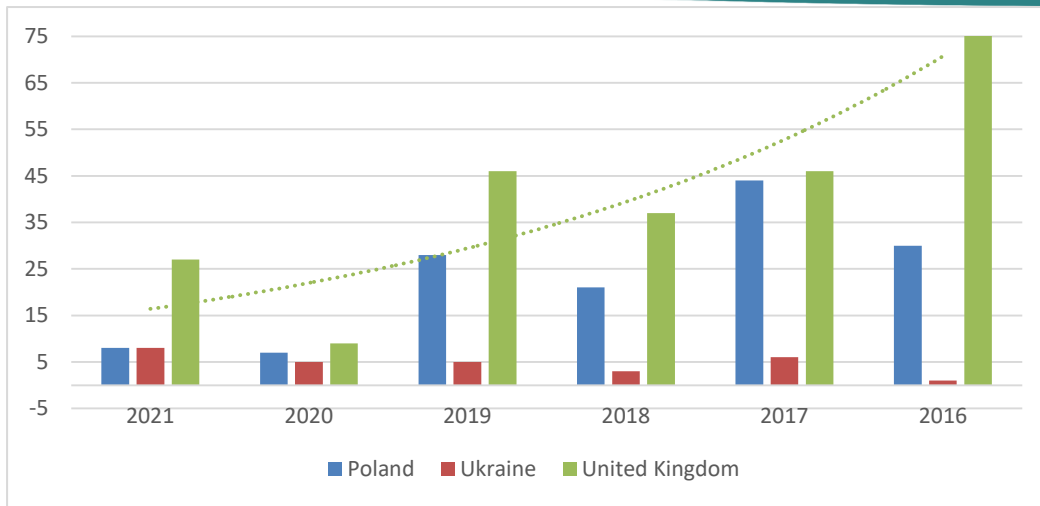
**Figure 5. Distribution of ICT profiles in 8 of the 68 countries whose profiles are presented in the EEN**

For instance, on September 27, 2021, there were a total of 631 profiles posted for the keyword "ICT" in the network. In particular, among them, there were 29 Technology Requests, 236 Technology Offers, 4 Research & Development Requests, 26 Business Requests, and 336 Business Offers. The distribution by type of profiles is shown in Figure 4.

The presented quantitative distribution of profiles by functional subtypes of "ICT" provides an idea of the relevance of the selected market segment at the moment. To further forecast the quantitative and qualitative

world in activities in the field of ICT development. Factor analysis of the time series from 2016-2021 allows the identification of an innovation cluster to enhance technology transfer in a group of three countries: Britain, Poland and Ukraine, which have a high level of correlations between the knowledge economy and a clear exponential trend line (Fig. 6).

Using the outlined algorithm for assessing and predicting the integrated index of the impact of digital platforms on the process of internationalization of the knowledge economy (Fig. 1), the initial step is to



**Figure 6. The time series on intensifying the technology transfer in Britain, Poland and Ukraine for activation of the knowledge economy**

**Table 1. Normalized statistical values of indicators that affect technology transfer in the context of activating the knowledge economy.**

Characteristic/Year	2021	2020	2019	2018	2017	2016
Smart city	0,50	0,37	0,58	0,60	0,50	0,70
IoT (internet of things)	0,63	0,235	0,595	0,67	0,76	0,67
Artificial intelligent	0,77	0,38	0,88	0,48	0,30	0,35
Blockchain	0,1	0,1	0,25	0,3	0,25	0,30
Cybersecurity	0,60	0,33	0,43	0,27	0,37	0,10
Industry 4.0	0,62	0,22	0,51	0,54	0,52	0,55

normalize the values to the interval (0; 1), where “0” means “very bad”, “1” means “very good”. We use the classical formula of data normalization (1), through comparison with the reference value.

$$z_i = \begin{cases} \frac{x_i}{x_{i, \max}}, & \text{if } x_i - \text{stimulant, } i \in N, x_{i, \max} \neq 0; \\ \frac{x_{i, \min}}{x_i}, & \text{if } x_i - \text{destimulator, } i \in N, x_i \neq 0; \end{cases} \quad (1)$$

where  $z_i$  – the statistical values of indicators are normalized in the interval (0; 1);  $x_i$ ,  $x_{i, \min}$  and  $x_{i, \max}$  are the smallest and largest values of the time series of values, respectively, presented in the table. 1.

The next step is to find the vector matrix of dispersion  $D_i$  and the matrix of absolute values of factor loads  $A_i$  (using axis rotation and quaternary normalization, which establishes simpler correlations between the corresponding variables and factors) separately for each of the groups of indicators.

Define matrices  $A_i$  and  $D_i$ :

$$A_i = \begin{pmatrix} a_{11} & a_{12} & \dots & a_{1j} \\ a_{21} & a_{21} & \dots & a_{2j} \\ \dots & \dots & \dots & \dots \\ a_{j1} & a_{j2} & \dots & a_{jj} \end{pmatrix}, D_i = \begin{pmatrix} d_1 \\ d_2 \\ \dots \\ d_j \end{pmatrix} \quad i = 1, 2, \dots, 7; j = 2, 3, \dots, 11, \dots (2)$$

where the absolute values of the elements of the matrix after the rotation of the axis and the quaternary normalization;  $d_j$  is the value of dispersions.

To find the weight of each factor of the corresponding group, we should carry out calculations:

$$A_i \times D_i = \begin{pmatrix} d_1 a_{11} + d_2 a_{12} + \dots + d_j a_{1j} \\ d_1 a_{21} + d_2 a_{22} + \dots + d_j a_{2j} \\ \dots \\ d_1 a_{j1} + d_2 a_{j2} + \dots + d_j a_{jj} \end{pmatrix} = \begin{pmatrix} \alpha_1 \\ \alpha_2 \\ \dots \\ \alpha_j \end{pmatrix} = \begin{pmatrix} 0,204 \\ 0,199 \\ 0,087 \\ 0,185 \\ 0,137 \\ 0,187 \end{pmatrix} \quad \dots (3)$$

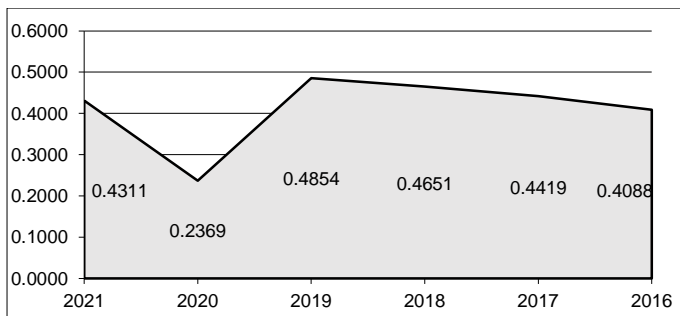
Using a matrix of weights for the indicators of each factor, we determine the scalar values of the integrated index of the impact of digital platforms on the process of internationalization of the knowledge economy based on multiplicative record form (4).

$$I = \prod_{j=1}^n (AZ)_j^{\alpha_j}, \quad \sum_j \alpha_j = 1, \quad \alpha_j > 0, \quad n = 6, \dots (4)$$

Performed technical calculations based on STATISTICA 10, Microsoft Excel 2019 and integrated convolution allow to determine, based on multiplicative formula (4), the dynamics of the integrated index of the impact of digital platforms on the internationalization of the knowledge economy in 2016-2021 (Fig. 7).

**Table 2. Vector-matrix of dispersions  $D_i$  and matrix of absolute values of factor loads  $A_i$** 

A					Matrices
0,6191	0,7406	0,1650	0,2016	0,0173	<b>D</b>
0,9687	0,1650	0,0653	0,1647	0,0545	53,66546
0,1482	0,2529	0,9560	0,0146	0,0003	33,35824
0,4733	0,8181	0,0881	0,3145	0,0065	9,72732
0,1181	0,8729	0,4607	0,1088	0,0056	3,15006
0,9697	0,0262	0,1928	0,1356	0,0581	0,09892

**Figure 7. Dynamics of the integrated index of the impact of digital platforms on the process of internationalization of the knowledge economy based on the multiplicative form of recording**

Using a multiplicative form of recording of the integrated index of the impact of digital platforms on the internationalization and activation of the knowledge economy allows for component-by-component analysis of extreme indicators. This approach is essentially a technological integrator of a range of services related to technology transfer in a rapidly growing digital economy. Monitoring the single integrated indicator simplifies visualization and improves the ability to predict the situation regarding the activation of the knowledge economy. In particular, the analysis of the dynamics of the integrated index of the impact of digital platforms on the process of internationalization of the knowledge economy based on the multiplicative form of recording (Fig. 7) points to the negative consequences of the Covid-19 pandemic, which caused a sharp decline in this index to its lowest value for the researched period, i.e., 0.2369 points.

## Discussion

The study confirms the first H1 hypothesis on the example of the functioning of the digital platform Enterprise Europe Network (EEN), which is increasingly used to internationalize technology transfer and is an integrated component of the classical macroeconomic system, comprising customers, entrepreneurs and the state. Calculated based on the multiplicative formula (4), the positive dynamics of changes in the integrated index of the impact of digital platforms on the process of

internationalization of the knowledge economy indicate their key role in ensuring the competitiveness of national economies.

The internationalization process of technology transfer is implemented through various organizational forms of technology transfer. Among them, so-called digital platforms provide contact among market agents. Users of digital platforms have the opportunity for advanced analytics of large databases accumulated worldwide. Thanks to all the positive effects of the operation of such digital platforms, many stakeholders can understand the views of customers, services and programs from the same data.

An important result of this study is the partial confirmation of the H2 hypothesis because, based on the study of correlations of the knowledge economy and the calculation of the exponential trend line, an innovation cluster there was identified in the direction of technology transfer in countries such as Britain, Poland and Ukraine. The enterprises of these countries, using the digital platform Enterprise Europe Network, have achieved the greatest cost reduction, support in cooperation and innovation to create new products and services, and increase the speed of product placement in target markets. In measures of the digital transformation of national economies, it should be recognized that digital platforms are becoming useful tools in this process. This article has already noted that according to the traditional macroeconomic understanding, business entities are divided into three groups: entrepreneurs, consumers and the state (Ewers, et al., 2021). In the digital economy, they remain unchanged, but the interaction will change radically. There will also be new agents (new roles of agents) that will determine the nature of this interaction. Taking into consideration the above research, we consider the creators of digital platforms to be new actors in the digital economy. Digital platforms will ensure interaction among the main macroeconomic agents - entrepreneurs, consumers, and the state. These facts confirm the study of Roig et al. (2020), which states that the current transformation of the national economies has acquired new competitive forms, which, in particular, manifested itself in the concentration of internationalization and digitalization.

The research also attempts to partially assess and form the basis for predicting the negative impact of the Covid-19 pandemic on the dynamics of high-tech solutions in the knowledge economy. In particular, two conclusions to discuss have been obtained concerning the H3 hypothesis. On the one hand, the calculated scalar values of the integrated index of the impact of digital platforms



on the internationalization of the knowledge economy indicate a sharp decline in 2020 to the lowest value, i.e., to 0.2369 points for the entire study period, but on the other hand, the Covid-19 pandemic intensified digitization processes in all spheres of economy, finance and everyday life.

In this context, digital platforms should be understood not as business analysis systems but as intelligent structural units with the functions of independent management of each element of the mechanism of a more global system through the principles of leadership.

## Conclusion

The paper develops research in forecasting quantitative and qualitative characteristics of innovation management and technology transfer in the context of the impact of global trends, namely digitalization and internationalization, on the knowledge economy. The article is aimed at evaluating the role of digital platforms in forming a new innovative paradigm of technology transfer management in the transnational space.

The hypothesis test results made it possible to realize that the traditional understanding of the macroeconomic system and its classical components have suffered some changes that have not been easy to predict for a long time. In the pandemic, the internationalization process of technology transfer has become a major factor determining the competitiveness of countries on the world stage. The spread of technology between different countries promotes the development of innovation everywhere and brings the economy to a new level of development. Countries that successfully implement digital technologies in all spheres of economic and social life are becoming world leaders.

First, the rapidly internationalizing process of internationalization of technology transfer has led to the fact that the countries capable of implementing digital technologies are reaching a new level of development of knowledge economy, whereas the countries that are unable to do so are left behind. The development gap continues its widen. The level of digitalization increasingly determines the competitiveness of national economies.

Second, in modern conditions, the role of internationalization of technology transfer is growing, which is proved by the practicality of creating an innovation cluster to enhance technology transfer in a group of three countries: Britain, Poland and Ukraine. This affects the interaction of the agents in the traditional macroeconomic system, which includes consumers, entrepreneurs, and the state. In the process of technology

transfer, the interaction among the subjects is intensified and the spread of technology in the economy is pushed. The economy is brought to a new level of development, i.e., the so-called knowledge economy.

Third, the binary impact of the pandemic has been revealed, which, in addition to the negative consequences, intensified digital platforms, which started playing a new important role. They can even be integrated into the macroeconomic system, and their impact is enormous as they form a new form of interaction based on technology transfer. The evaluation and forecasting of quantitative and qualitative characteristics of the impact of digital platforms on the internationalization of technology transfer and knowledge economy in general outlines the most likely scenario when the classical form of interaction among the economic entities (consumers, entrepreneurs and the state) inside the macroeconomic system changes and becomes largely influenced by the ICT. The process of internationalization of technology transfer is becoming a major trend, accelerating the digitalization and development of the knowledge economy and determining the level of development of the national economy as a whole.

## Conflict of Interest:

We do not have conflict of interest.

## References

- Aggarwal, V., & Kapoor, M. (2021). Demystifying the role of internal dynamics in the path of innovative competitiveness: a serial mediation model of international joint ventures. *Cross-Cultural and Strategic Management*, 28(4), 839–866. <https://doi.org/10.1108/CCSM-02-2021-0023>
- Alekseieva, K., Maletych, M., Ptashchenko, O., Baranova, O., & Buryk, Z. (2023). State business support programs in wartime conditions. *Economic Affairs*, 68(01), 231-242. URL: <http://ndpublisher.in/admin/issues/EAv68n1sz.pdf>
- Alekseieva, K., Novikova, I., Bediukh, O., Kostyuk, O., & Stepanova, A. (2021). Technological orders change caused by the pandemics: Digitalization in the internationalization of technology transfer. *Problems and Perspectives in Management*, 19(3), 261-275. [http://dx.doi.org/10.21511/ppm.19\(3\).2021.22](http://dx.doi.org/10.21511/ppm.19(3).2021.22)
- Britto J.N.D., Ribeiro L.C., & da Motta e Albuquerque E. (2021). Global systems of innovation: introductory notes on a new layer and a new hierarchy in innovation systems. *Innovation and*

## Development.

<https://doi.org/10.1080/2157930X.2021.1934255>

- Chung, H.F.L., & Ho, M.H.W. (2021). International competitive strategies, organizational learning and export performance: a match and mismatch conceptualization. *European Journal of Marketing*, 55(10), 2794-2822. <https://doi.org/10.1108/EJM-04-2019-0309>
- De Moortel, K., & Crispeels, T. (2018). International Technology Transfer Models: a University Perspective. *Technological Forecasting and Social Change*, 135, 145-155. <https://doi.org/10.1016/j.techfore.2018.05.002>
- Dorozynski, T., Dorozynska, A., & Kuna-Marszalek, A. (2015). SME's innovation and internationalization in the knowledge-based economy: EU case. *Handbook of Research on Entrepreneurship in the Contemporary Knowledge-Based Global Economy*, pp. 445-478. <https://doi.org/10.4018/978-1-4666-8798-1.ch019>
- Demirbag, M., Apaydin, M., & Sahadev, S. (2021). Micro-foundational dimensions of firm internationalisation as determinants of knowledge management strategy: A case for global strategic partnerships. *Technological Forecasting and Social Change*, 165. <https://doi.org/10.1016/j.techfore.2020.120538>
- Ewers, M.C., Khattab, N., Babar, Z., & Madeeha, M. (2021). Skilled migration to emerging economies: the global competition for talent beyond the West. *Globalizations*, 19(2), 268-284. <https://doi.org/10.1080/14747731.2021.1882816>
- Hilmerssona, F.P., & Hilmerssonb, M. (2021). Networking to accelerate the pace of SME innovations. *Journal of Innovation & Knowledge*, 6(1), 43-49. <https://doi.org/10.1016/j.jik.2020.10.001>
- Jöns, H. (2007) Transnational mobility and the spaces of knowledge production: A comparison of global patterns, motivations and collaborations in different academic fields. *Social Geography*, 2(2), 97-114. <https://doi.org/10.5194/sg-2-97-2007>
- Jowi J.O. (2012). African universities in the global knowledge economy: The good and ugly of internationalization. *Journal of Marketing for Higher Education*, 22(1), 153-165. <https://doi.org/10.1080/08841241.2012.705799>
- Karlsson, C., Gråsjö, U., & Wixe, S. (2015). Innovation and entrepreneurship in the global economy: Knowledge, technology and internationalization. *Innovation and Entrepreneurship in the Global Economy: Knowledge, Technology and Internationalization*. pp. 1-337. <https://doi.org/10.4337/9781783477326>
- Li, P., & Bathelt, H. (2021). Spatial Knowledge Strategies: An Analysis of International Investments Using Fuzzy Set Qualitative Comparative Analysis (fsQCA). *Economic Geography*, 97(4), 366-389. <https://doi.org/10.1080/00130095.2021.1941858>
- Lai, Y., & Vonortas, N.S. (2021). Returnee academic entrepreneurship in China. *Journal of Intellectual Capital*, 22(1), 8-23. <https://dx.doi.org/10.1108/JIC-12-2019-0281>
- Marchioria, D., & Francob, M. (2020). Knowledge transfer in the context of inter-organizational networks: Foundations and intellectual structures. *Journal of Innovation & Knowledge*, 5(2), 130-139. <https://doi.org/10.1016/j.jik.2019.02.001>
- Melnikas, B. (2011). Knowledge economy: Synergy effects, interinstitutional interaction and internationalization processes. *Engineering Economics*, 22(4), 367-379. <https://doi.org/10.5755/j01.ee.22.4.712>
- Orero-Blata, M., Palacios-Marquésb, D., & Garzón, D. (2020). Knowledge assets for internationalization strategy proposal. *Journal of Innovation & Knowledge*, 6(4), 214-221. <https://doi.org/10.1016/j.jik.2020.08.002>
- Qamruzzaman, M., Tayachi, T., Mehta, A.M., & Ali, M. (2021). Do international capital flows, institutional quality matter for innovation output: The mediating role of economic policy uncertainty. *Journal of Open Innovation: Technology, Market, and Complexity*, 7(2). <https://doi.org/10.3390/joitmc7020141>
- Roig, A., Sun-Wang, J.L., & Manfredi-Sánchez, J.L. (2020). Barcelona's science diplomacy: towards an ecosystem-driven internationalization strategy. *Humanities and Social Sciences Communications*, 7(1), 1-9. <https://doi.org/10.1057/s41599-020-00602-y>
- Santos, G.M.C., Marques, C.S., Ratten, V., & Ferreira, J.J. (2021). The impact of knowledge creation and acquisition on innovation, competition and international opportunity development. *European Journal of International Management*, 16(3), 450-472. <https://doi.org/10.1504/EJIM.2021.117511>
- Stepanova, A., Bediukh, O., & Novikova, I. (2019). Contradictions of Enterprise Europe Network

- Using in Ukraine. *Problems and Perspectives in Management (Open Access)*, 17(4), 190-202. [http://dx.doi.org/10.21511/ppm.17\(4\).2019.16](http://dx.doi.org/10.21511/ppm.17(4).2019.16)
- Vătămănescu, E.-M., Gorgos, E.A., Ghigiu, A. M., & Pătruț, M. (2019). Bridging Intellectual Capital and SMEs Internationalization through the Lens of Sustainable Competitive Advantage: A Systematic Literature Review. *Sustainability*, 11(9). <https://doi.org/10.3390/su11092510>
- Willoughby, K.W., & Mullina, N. (2021). Reverse innovation, international patenting and economic inertia: Constraints to appropriating the benefits of technological innovation. *Technology in Society*, 67. <http://dx.doi.org/10.1016/j.techsoc.2021.101712>
- Yindan, Ye, De Moortel, K., & Crispeels, T. (2019). Network dynamics of Chinese university knowledge transfer. *The Journal of Technology Transfer HTTPS*, 45(3). 1228-1254. <http://dx.doi.org/10.1007/s10961-019-09748-7>
- Zhao, S., Papanastassiou, M., Pearce, R.D., & Iguchi, C. (2021). MNE R&D internationalization in developing Asia. *Asia Pacific Journal of Management*, 38(3), 789-813. <https://doi.org/10.1007/s10490-020-09705-1>
- Zalizko, V., Nowak, D., & Kukhta, P. (2020). Economic Security of Ukraine: Innovative Concept of Strengthening in the context of COVID-19. *Scientific Bulletin of National Mining University*, 4, 152-157. <https://doi.org/10.33271/nvngu/2020-4/152>.

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