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Knowledge as a factor of competitive advantages: prospects for Ukraine

Abstract. Introduction. In recent decades, economic growth of the leading world countries have occurred on the basis of information and knowledge embodied in new products, production technologies and management at all stages of production and marketing. Due to the generation and commercialisation of knowledge competitive advantages of individual companies, institutions and national economies, leaders of economic growth are formed and advanced. Considering the current trends in the changing conditions of economic and political space of Ukraine and abroad, which will only intensify fast and efficient reorientation to new markets is relevant for the domestic producers. *The purpose* of the study is to investigate the role and place of knowledge as an element of intellectual capital of organisations to ensure their competitiveness in light of trends in the global economy; to assess the current position and to outline the problems and perspectives of fast and efficient innovation growth in Ukraine based on knowledge. *Results.* The role of knowledge in providing competitive advantages of organisations has been outlined. The place of knowledge relevant to intellectual capital of organisations is specified. It has been determined that knowledge as an element of intellectual capital has a dual nature: it can be regarded both as an intellectual resource and as a possibility to implement existing intellectual capital of organisations. The influence of knowledge in the global economy is investigated. Ukraine's position in the world rankings, which reflects the level of economic development based on intellectual capital and innovation, as well as the status of its competitiveness, has been studied. From these positions, we have specified strengths and weaknesses of the national economy and outlined the prospects of economic growth based on knowledge as an element of intellectual capital.

Keywords: Intellectual Capital; Knowledge Economy; Knowledge; Potential of Innovative Development; Innovation Development Model; Competitive Advantages

JEL Classification: F29; O30; O31; O33

DOI: <http://dx.doi.org/10.21003/ea.V156-0011>

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Знання як фактор конкурентних переваг: перспективи України

Анотація. Окреслено роль знань у забезпеченні конкурентних переваг організацій. Уточнено місце знань в інтелектуальному капіталі організації. Визначено, що знання як елемент інтелектуального капіталу, мають дуалістичну природу: їх можна розглядати як інтелектуальний ресурс, а також як можливість реалізації наявного інтелектуального капіталу організації. Досліджено вплив знань на розвиток світової економіки. Досліджено позиції України у світових рейтингах, які відображають рівень економічного розвитку країн на основі інтелектуального капіталу та інновацій, а також стан їхньої конкурентоспроможності. Визначено сильні та слабкі сторони вітчизняної економіки, а також окреслено проблеми та перспективи її зростання на основі знань як елементу інтелектуального капіталу.

Ключові слова: інтелектуальний капітал; економіка знань; знання; потенціал інноваційного розвитку; інноваційна модель розвитку; конкурентні переваги.

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Знания как фактор конкурентных преимуществ: перспективы Украины

Аннотация. Определена роль знаний в обеспечении конкурентных преимуществ организаций. Уточнено место знаний в интеллектуальном капитале организации. Определено, что знания как элемент интеллектуального капитала, имеют дуалистическую природу: их можно рассматривать как интеллектуальный ресурс и возможность реализации имеющегося интеллектуального капитала организации. Изучено влияние знаний на развитие мировой экономики. Исследованы позиции Украины в мировых рейтингах, отражающих уровень экономического развития стран на основе интеллектуального капитала и инноваций, а также состояние её конкурентоспособности. Определены сильные и слабые стороны экономики Украины, а также обозначены проблемы и перспективы её роста на основе знаний как элемента интеллектуального капитала.

Ключевые слова: интеллектуальный капитал; экономика знаний; знания; потенциал инновационного развития; инновационная модель развития; конкурентные преимущества.

1. Introduction. In recent decades, economic growth of leading countries has taken place based at information and knowledge embodied in new products, technologies and management at all stages of production and marketing. Due to the generation and commercialisation of knowledge competitive advantages of individual companies, institutions and national economies, leaders of economic growth are being formed and advanced.

Considering the current trends in the changing conditions of economic and political space of Ukraine and abroad, which will only intensify, it is relevant for the domestic producers to provide fast and efficient reorientation to new markets at which one will have to work under reasonable rules.

However, this requires qualitative and innovative solutions and approaches based on effective use of knowledge and innovation. Thus, the problem of acquisition and strengthening the domestic enterprises' exceptional competitive advantages through the generation and use of knowledge in terms of reorientation to new markets is important and requires a detailed consideration and research.

2. Brief Literature Review. Fundamental principles of the knowledge economy formation and development are highlighted in the works of P. Drucker (1991) [1], F. Machlup (Machlup, 1962) [2], T. Sakaiya (1991) [3], A. Toffler (1990) [4] and others.

Approaches to knowledge management in organisations are disclosed in the works of H. J. Davenport (2000) [5], L. Prusak (2000) [5], K.-E. Sveiby (2001) [6], B. Milner (2003) [7] etc.

Forming the competitive advantages of enterprises and institutions on the basis of knowledge is studied in the works of I. Nonaka (1991) [8], C. J. Mayer (1997) [9], R. Lubit (2001) [10], G. S. Erickson (2000) [11], H. N. Rothberg (2000) [11].

At the present stage of development, significant technological changes are taking place in the world. One of the major issues discussed at the World Economic Forum 2016 in Davos was the question of the so-called Fourth Industrial Revolution. We can observe a gradual transition to the 6th technological structure characterised by significant technological change, namely the development of biotechnology, the production of new materials, alternative energy sources, optoelectronics, nanotechnology, software and modeling tools, artificial intelligence, etc. (Soskin, Matviychuk-Soskina, 2013) [12]. All these technologies require a large number of specific knowledge, both for their development and for their commercialisation and output markets.

Recent researches in the field of economic knowledge are largely related to effective knowledge management. For example, the main issues explored by leading scientists in the world within the period 2010-2015 are the assessment of knowledge managing tools [13], the interaction of knowledge science and communication science [14], the process of acquiring knowledge in knowledge-based clusters [15], the assessment of knowledge loss risk from the personnel turnover [16], knowledge management in social interaction [17], sharing knowledge by using Web 2.0 [18], models of knowledge management [19], the motivation to produce knowledge for innovation [20], the concept of knowledge transfer [21], knowledge-based personal skills of workers in the 21st century [22], etc.

However, despite a significant number of works dealing with the development of managerial knowledge and knowledge of economy at institutions, a number of issues related to the formation and maintenance of competitive advantages in modern conditions remain unresolved and require further study. The need to define the role of knowledge as a key factor in obtaining competitive advantages to enterprises and institutions for sustainable and effective development in the long term is among them.

3. The Purpose of the article is to investigate the role and place of knowledge as an element of intellectual capital of organisations to ensure its competitiveness with regard to trends in the global economy; to assess the current position and to outline the problems and perspectives innovation growth in Ukraine based on knowledge.

4. Results. According to A. Brooking (2001) [23], D. Bell (1986) [24], A. Toffler (1990) [4], V. Inozemtsev (1988) [25], analysis and synthesis of theoretical developments in the field of scientific knowledge economy shows that knowledge is an element of intellectual capital of enterprises or institutions (organisations).

In particular, A. Brooking defines intellectual capital as an intangible asset which includes knowledge, people's creativity, their skills (human assets), intellectual property and other infrastructure assets [23]. Under intellectual capital, V. Inozemtsev understands the totality of information, knowledge, which plays the role of the «collective brain» that generates information related to the daily knowledge and skills of employees, their experience, communication between them and the image of the company and organizational structure [25].

The works of economists such as Y. Shypulina (2010) [26], S. Illiashenko (2010) [26], O. Savchuk (2003) [27], V. Kalishenko (2002) [28], L. Martyusheva (2002) [28] show that intellectual capital, in turn, is a subsystem of organisations' potential innovative development.

Thus, it is stated in [26] that «the potential of innovative development is a set of interrelated resources and capacity for their implementation, determining the ability of the dominant entity align with the external internal capacity of development on the basis of constant research and use of new areas and ways to implement existing and future market opportunities».

Therefore, knowledge has a dual nature: on the one hand, it is an important intellectual resource (asset) of organisations, on the other hand, it provides an opportunity to realize the full potential of innovative development within a certain organisation.

Figure 1 shows the potential value of innovative development, intellectual capital and knowledge of organisations.

- In general, intellectual capital has three components [29]:
- the human component which includes knowledge, work culture, personal experiences, creative work and know-how;
 - the organisational component which is represented by patents, licenses, trademarks, corporate culture, organisational structure, etc.
 - the consumer (interface) component relevant to connections with contact audiences, which include suppliers, customers, financial institutions.

Obviously, knowledge contains all the components of intellectual capital, and is an entity, which by its nature answers the question: *how to do all necessary to achieve the goal?* Thus, knowledge as the human component characterises the human ability to perform work efficiently and in a creative manner, exactly as required by the production process relevant to a technology or a service. The organisational component of intellectual capital also includes knowledge. In this respect, patents and licenses are evident knowledge which is considered to be a documented, formalised result of intellectual activity. Knowledge is also evident in the consumer subsystem of intellectual capital. Hence, relations with contact audience always require knowledge that explains the rules of constructing or supporting such relationships.

As noted by P. Drucker [1], knowledge is the only competitive advantage in conditions of instability.

The available statistics clearly characterise global trends regarding the use of intellectual capital and knowledge as its element over the past 10 years. Figures 2-5 are the results of the World Bank studies on global trends in the use of intellectual capital [19].

Similar trends may indicate an increase in the sale of knowledge as a commodity which is necessary for functioning in today's globalised economic environment.

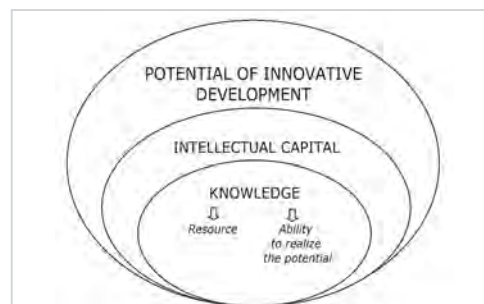


Fig. 1: Place of knowledge in intellectual capital and innovative potential of the company
Source: Compiled by the authors

Figures 3 and 4 describe the rapid development of innovation (design and technology) in the fifth technological structure, which has found its place in the manufacturing sector through commercialisation.

Figure 5 shows successful commercialisation of technologies and demonstrates that knowledge as intellectual assets is an effective source to increase profitability.

It is right to characterise the role of knowledge in various types of human activity, including business data from Internet Live Stats on the number of Internet users and the number of websites (Figure 6) [31]. They suggest using the Internet not only for personal entertainment but also for business, in particular by establishing Web missions on the Internet which will provide highly intellectual services, consulting, online sales of goods, etc.

Obviously, statistics in Figures 2-6 show that the use of knowledge as an element of intellectual capital at all levels of the economy, in all areas of production of goods and services is one of the characteristics of modern economic development.

Let us consider the role and place of knowledge in the economic growth of Ukraine, which, as the events of recent years have shown, seeks to join the global community of civilised countries. This can only be achieved by standing on the path of innovative development based on knowledge.

Tables 1 and 2 indicate the position of Ukraine in the world ranking of innovation according to data from the World Intellectual Property Organisation (WIPO) [32].

Table 1 indicates a strong position that Ukraine has in terms of knowledge as a resource component of intellectual capital.

Table 2 indicates a weak position of Ukraine in terms of knowledge as a resource component of intellectual capital (2015).

The analysis of rankings in Tables 1 and 2 shows that Ukraine has a fairly decent position regarding the resource of intellectual capital. However, comprehensive global ratings indicate otherwise. It is logical to assume that Ukraine has a strong resource base in the field of security personnel (13th, 20th, 39th places in the WIPO rankings; see Table 1), which, in turn, is the source of knowledge generation (14th, 15th, 17th, 19th in the WIPO ratings; see Table 1). However, the analysis of Ukraine's weak positions specified in Table 2 shows that the use of knowledge and intellectual capital is not efficient.

Figure 7 shows the distribution of countries by group development.

Numerous data indicate a number of countries with different levels of development that were in one group or another. According to the index, the yield of innovation and economy of Ukraine has come to the level of development below the middle [32]. Thus, our country occupies position 4 in the group of countries that have their levels of development below the middle among the 34 countries rated by the Global Innovation Index. According to the Human Development Index, Ukraine is positioned as a country that has a level of development above the middle.

Bearing in mind the country's rates, one can assume that it is necessary to increase the level of innovation in the economy through the use of intellectual capital, including knowledge as its element. Knowledge enables us to effectively use innovations, to increase the level of innovations at enterprises, which in turn influences the overall level of innovations in the economy. Thus, it is obvious that the increased use of knowledge can provide organisations with increased efficiency and profitability.

Figure 8 presents data published by the Foundation for Effective Governance 2013 on the classification of the stages of economic development.

The above figures characterise the number of countries with economies related to a certain stage of development. The data marked «\$» (US dollars) reflect the extent to which countries fall in terms of gross domestic product (GDP) per capita.

Ukraine has joined the group of countries that are in the process of orientation on efficiency. At the stage of orientation on efficiency, the countries compete through the skillful and effective use of industrial processes and professional training. At the stage of orientation on continuous innovation, the countries compete through a progressive renewal of the economy with new innovations, technologies and methods of management. This, in turn, is reflected in wage rates and maintains work of

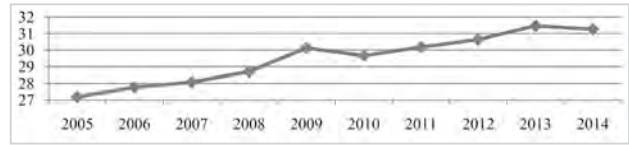


Fig.2: Part of providing information and communication services in the total volume of service in the world, %
Source: Compiled by the authors according to [30]

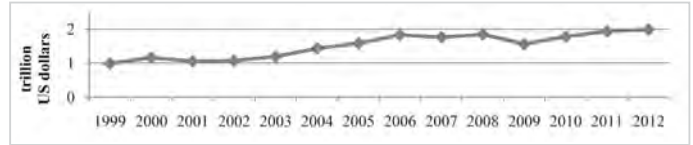


Fig. 3: Exports of high technological products in the world, US dollars
Source: Compiled by the authors according to [30]

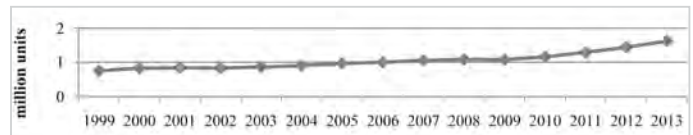


Fig. 4: Number of applications for patents in the world, million units
Source: compiled by the authors according to [30]

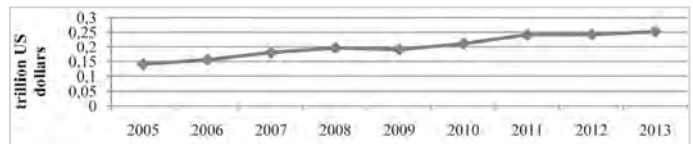


Fig. 5: Revenues from the use of intellectual property in the world, US dollars
Source: compiled by the authors according to [30]

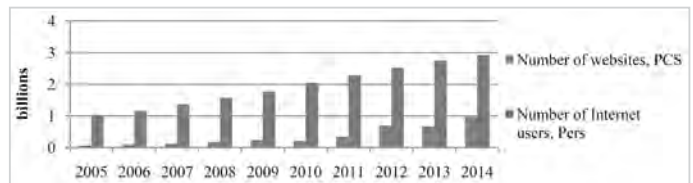


Fig. 6: Number of websites and Internet users in the world
Source: compiled by the authors according to [31]

Tab. 1: Ukraine's position in the world rankings of Knowledge and Innovation, 2015 (strengths)

Position	Strengths
13	Tertiary enrolment, % gross (Tertiary education)
14	Knowledge creation
15	Innovation Efficiency Ratio
17	GERD financed by abroad, % (Gross Expenditure on Research and Development)
18	Expenditure on education, % GDP
19	Domestic res trademark app./bn. PPP\$ GDP*
20	Graduates in science & engineering, %
39	Knowledge-intensive employment, %

Note: * GDP (Gross domestic product) per person employed (constant 1990 PPP \$). GDP per person employed is gross domestic product (GDP) divided by total employment in the economy. Purchasing power parity (PPP) GDP is GDP converted to 1990 constant international dollars using PPP rates. An international dollar has the same purchasing power over GDP that a U.S. dollar has in the United States.

Source: Compiled by the authors according to [32]

this global mechanism. The result of this development model is a high level of social standards and leading positions in rankings of economic and social development of the world's leading organisations.

Tab. 2: Ukraine's position in the world rankings of Knowledge and Innovation, 2015 (weaknesses)

Position	Weaknesses
43	Citable documents H index
46	QS university ranking (Average score of the top 3 universities at the QS world university ranking)
46	High- & medium-high-tech manufactures, %
47	Computer software spendings, % GDP
56	KNOWLEDGE ECONOMY INDEX (2012)
58	Scientific & technical articles/bn. PPP\$ GDP
59	GDP (Gross domestic product) (2014)
64	GLOBAL INNOVATION INDEX
66	Growth rate of PPP\$ GDP/worker, %
74	High-tech imports less re-imports, %
81	HUMAN DEVELOPMENT INDEX
88	Knowledge absorption
89	ICT use

Source: Compiled by the authors according to [30; 32; 33]

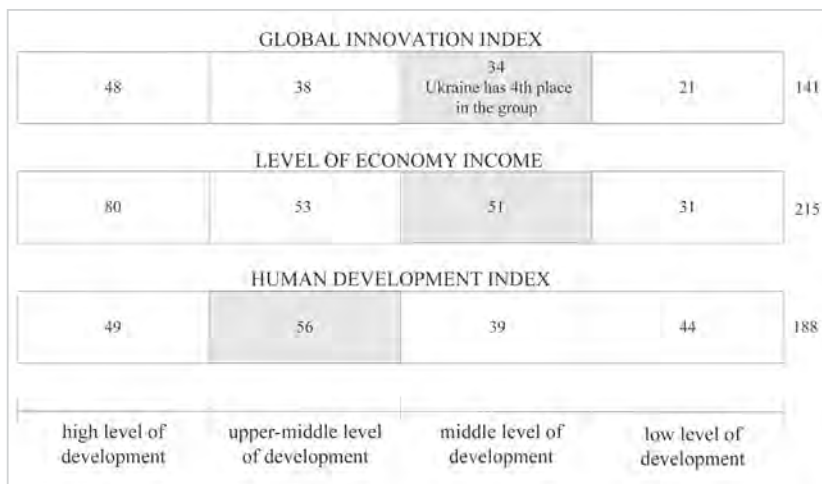


Fig. 7. Distribution of countries by income in the economy, innovation index and the human development index 2015

Source: Compiled by the authors according to [32; 33]

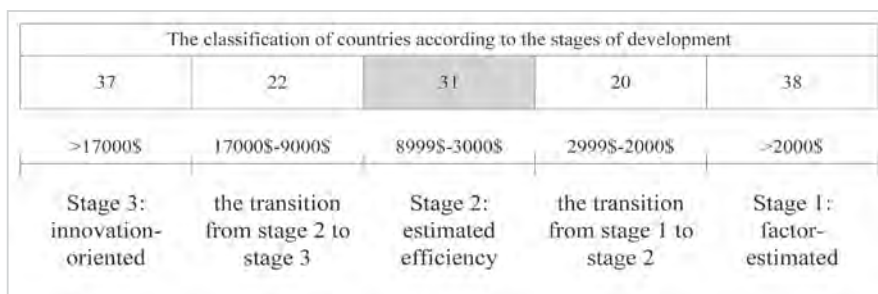


Fig. 8. Classification of the counties by the stages of development (2013)

Source: Compiled by the authors according to [34]

As noted by M. Porter (Porter, 1993), «one of the most important goals of any state is to provide high, growing standard of living for its citizens» [35, 567]. A high level of social standards is a prerequisite for constant modernisation of the economy, which manifests itself in a constant growth of productivity, which in turn becomes possible due to innovation.

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In addition, the use of knowledge, intellectual capital and innovation makes it possible to create high-tech products with high added value. According to [36, 96] there is a direct correlation between the increase in sales of innovative products and value added growth. This, in turn, affects the increase in profits and strengthens competitive advantage in a constantly growing demand for high-tech goods and services. After long-term use of the same technology inevitably leads to the loss of productivity compared to the continually updated general market level. Thus, there is obsolescence of production technologies and a gradual loss of market position.

Summing up, it should be noted that the negative changes taking place in Ukraine's economy in 2014-2015 have significantly worsened conditions for the transition to an innovative path of development. In particular, there was a decrease in gross domestic product from 177.8 billion USD in 2014 to 130.7 billion USD in 2015; the ranking dropped from 77 to 110 position by political stability and from 127 to 136 position by the indicator of favorable conditions for investment [32].

To improve the situation, big changes in the political and legal environment towards stimulating business innovation and demonopolisation are needed.

5. Conclusions. Summarising the above, we can draw the following conclusions.

In terms of the increased competition in the domestic and international markets, information and knowledge maintain the leading position among the factors determining competitiveness of organisations and national economies.

Knowledge plays an important role in providing competitive advantages for organisations in view of constantly changing economic conditions. Thereby, it can be considered as an element of organisations' intellectual capital which, in turn, is part of innovative development.

Knowledge as part of intellectual capital of organisations has a dual nature: it should be viewed both as a resource and a possibility to implement the existing potential of a certain organisation in the existing market conditions from the prospects of their development.

The results of the study confirm the influence of knowledge on the global economy with the important role of knowledge-based innovation in ensuring economic growth.

We have highlighted the strengths and weaknesses of Ukraine's economy from the standpoint of knowledge to ensure the transition to innovative development. Also, we have outlined the problems and prospects of economic growth in Ukraine based on knowledge as an element of intellectual capital. We have determined the stage development of effective mechanisms for knowledge

management within organisations, which will allow them to form and promote their competitive advantages.

Further research should focus on the analysis and synthesis of existing theoretical and methodological approaches to knowledge management at the level of organisations.

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Received 20.01.2016

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Стаття надійшла до редакції 20.01.2016