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## INFLUENCE OF INFORMATION NETWORK INFRASTRUCTURE ON THE DEVELOPMENT OF THE MODERN ECONOMY

*The issues of the influence of information technologies on the socio-economic processes of the state in the conditions of institutional transformations are examined. The trends for the development of Ukrainian information technology market are investigated. The basic problems and obstacles for the rapid informatization of Ukrainian society are established. The main information technologies that influence an economic development and modern social transformations are considered. The prospects and main directions of the movement of the national information network infrastructure and its integration into the world market are revealed.*

*The study of the impact of information technologies on the socio-economic processes of the state makes it possible to identify the system of phenomena and problems that are caused by the growth of the dynamics of social processes in the information sphere, the intensification of the use of information resources, the intensification of the processes of globalization of the information sector of the state as a factor of institutional transformation. The information sector of the national economy is of great importance for a modern socio-economic development of the state, especially in the context of building an information society. Solution of a number of problems that hinder the development of this sector will make it possible not only to meet the information needs of society, business entities and various sectors of the economy, but also to increase the competitiveness of the country and strengthen the economic position of Ukraine in the world.*

*Keywords: information technologies, information network economy, market, network.*

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## ВПЛИВ ІНФРАСТРУКТУРИ ІНФОРМАЦІЙНОЇ МЕРЕЖІ НА РОЗВИТОК СУЧАСНОЇ ЕКОНОМІКИ

*Розглядаються питання впливу інформаційних технологій на соціально-економічні процеси держави в умовах інституційних перетворень. Досліджено тенденції розвитку українського ринку інформаційних технологій. Встановлено основні проблеми та перешкоди для швидкої інформатизації українського суспільства. Розглянуто основні інформаційні технології, що впливають на економічний розвиток і сучасні соціальні перетворення. Розкрито перспективи та основні напрямки руху інфраструктури національної інформаційної мережі та її інтеграції в світовий ринок.*

*Вивчення впливу інформаційних технологій на соціально-економічні процеси держави дозволяє виявити систему явищ і проблем, які, як правило, обумовлені зростанням динаміки соціальних процесів в інформаційній сфері, інтенсифікацією використання інформаційних ресурсів і процесів глобалізації інформаційного сектора держави як фактора інституційної трансформації. Інформаційний сектор народного господарства має велике значення для сучасного соціально-економічного розвитку держави, особливо в контексті побудови інформаційного суспільства. Рішення ряду проблем, які заважають розвитку цього сектора, дозволить не тільки задовольнити інформаційні потреби суспільства, господарюючих суб'єктів і різних секторів економіки, а й підвищити конкурентоспроможність країни і зміцнити економічні позиції України в світі.*

*Ключові слова: інформаційні технології, інформаційна мережева економіка, ринок, мережа.*

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## ВЛИЯНИЕ ИНФРАСТРУКТУРЫ ИНФОРМАЦИОННОЙ СЕТИ НА РАЗВИТИЕ СОВРЕМЕННОЙ ЭКОНОМИКИ

*Рассматриваются вопросы влияния информационных технологий на социально-экономические процессы государства в условиях институциональных преобразований. Исследованы тенденции развития украинского рынка информационных технологий. Установлены основные проблемы и*

препятствия для быстрой информатизации украинского общества. Рассмотрены основные информационные технологии, влияющие на экономическое развитие и современные социальные преобразования. Раскрыты перспективы и основные направления движения инфраструктуры национальной информационной сети и ее интеграции в мировой рынок.

Изучение влияния информационных технологий на социально-экономические процессы государства позволяет выявить систему явлений и проблем, которые, как правило, обусловлены ростом динамики социальных процессов в информационной сфере, интенсификацией использования информационных ресурсов и процессов глобализации информационного сектора государства как фактора институциональной трансформации. Информационный сектор народного хозяйства имеет большое значение для современного социально-экономического развития государства, особенно в контексте построения информационного общества. Решение ряда проблем, которые мешают развитию этого сектора, позволит не только удовлетворить информационные потребности общества, хозяйствующих субъектов и различных секторов экономики, но и повысить конкурентоспособность страны и укрепить экономические позиции Украины в мире.

Ключевые слова: информационные технологии, информационная сетевая экономика, рынок, сеть.

### **Formulation of the problem**

The modern stage of civilizational development is characterized by the rapid development of information technologies that cover all spheres of human activity, create opportunities for increasing the efficiency of production, radically change the mechanisms of the functioning of many institutions, states. Influenced by new information technologies, extensive production turns intensive, the division of labor and technology management undergo radical changes. The development of information technologies creates fundamentally new opportunities for modern social transformations.

On the intellectual resources, knowledge-intensive and information technologies the modern global (informational) economy is based, the essence of which lies in the qualitatively new innovation-technological level of all its sectors, including the active productive forces of society.

### **Analysis of recent research and publications**

Issues of the formation of the information and network society, primarily of the economy in the global and national dimensions, are considered in the works of S. Piiga, V. Sandughea, I. Sedikova, L. Fedulova, M. Tchaikovsky and others. However, in our opinion, there are not enough systematic studies concerning the importance of information technology and prospects for its development in Ukraine.

### **The purpose of the article**

The purpose of the article is to study trends in the development of the Ukrainian information technology market, to identify the main problems and barriers for the rapid informatization of Ukrainian society, as well as to identify the prospects and main directions of the movement of the national information network infrastructure and the possibility of its integration into the world market.

### **Presentation of the main material**

The world increasingly ceases to be systematically unified. Progressive dominance of individual preferences causes the growing complexity of economic relations. On the basis of the mechanisms of the electronic communication system, communicative rationalism prevails - temporal barriers and infinity of space are instantly overcome: "time" ceased; "Space" disappeared [5].

Information network data bases economic relations primarily on the basis of horizontal, rather than vertical articulation, it is invariant with respect to hierarchical constancy of macroeconomic relations. At the same time, modern geo-economic bifurcations create a growing need for information development and ordering of unprecedentedly diverse microeconomic relations. At the same time, organizational management networks within national economies, as well as in the planetary dimension, require fundamental changes [7].

Modern developed countries are paying a lot of attention to the development of information communication technologies. Unfortunately, Ukraine's share in the global IT market is extremely small, and the level of infrastructure development in this industry is low. Therefore, special attention should be given to the experience of foreign states, which have managed to make a "breakthrough in development" in recent decades. In particular, Singapore, Finland, Sweden, Ireland, Israel, China, South Korea, Malaysia, and Taiwan have overcome the "digital divide" by means of well-developed and realistic strategies for the development of the information society in these countries.

The experience of these countries shows that in the process of formation of national informatization, at the level of legislation, the problem of ensuring the widespread use of information technology in all spheres of society's life should be put on a par with other major issues - poverty reduction, quality of education and health care, etc.

Domestic information technology market is in the stage of active formation. In particular, the company's computerization market is expanding, the Internet access network is expanding, and a perceptible increase in the export of Ukrainian software products and technology services is noted.

As illustrated by statistics, the IT industry in the world has grown by an average of 10% per year over the past few years. Even during the global financial crisis of 2008, analysts at Gartner (a leading global research and consulting company in the field of information technologies) not only called Ukraine one of the top 30 countries for IT outsourcing, but also added it to the top three economically attractive countries in the EMEA region.

It should be noted that of the 13 EMEA countries that reached the top 30, all except Morocco and Ukraine showed a drop in IT exports. Ukraine was represented by seventh of the top ten market leaders in Central and Eastern Europe. Five of them are members of the Association "IT Ukraine". In addition, Ukraine received the ITO Destination of the Year 2011 title from the Outsourcing Center, a leading industry web resource that brings together outsourcing, best practices and founder of the Outsourcing Excellence Awards [7].

Accordingly, in 2011, a significant jump in the industry occurred in Ukraine itself (in particular, in 2009-2011, the volume of exports of software products of Ukraine doubled, of which 70% was directed to the American market) - IT Association of Ukraine successfully lobbied the bill for support IT companies that was adopted as a law "On State Support to the Development of the Software Industry" in 2012. Information from the World Bank for 2011 confirms the fairness of analysts' high appraisal. IT exports reached \$ 1,275 million, equivalent to 35% annual growth [1].

According to the World Information Technology Report (2016) published by the World Economic Forum, Ukraine ranked 64th among 139 countries in terms of information and communication technology development this year. The basis of the rating assessment is the Networked Readiness Index 2016, which determines the level of information communication technologies (ICTs) development in the countries of the world [10].

According to Global Tech Market Outlook, in 2016, the global telecommunications market grew by 4.5%. The largest development of telecommunications to date is observed in the United States. The growth rate of the telecommunications market in 2016 was at 5.1%. According to analysts, this indicator will reach 5.9% in 2017. Individual growth rates of telecommunications use are observed throughout the world map. By the end of 2016, India, Mexico, Sweden, China, Poland, Israel had a 6% growth in the telecommunications market, while in Canada, Australia, South Korea, and most other European countries, this indicator grew much slower. According to analysts' forecasts, in 2017, the countries of Latin America and Eastern Europe can become leaders in this market. As for countries such as Japan, Brazil and South Africa, the telecommunications market is almost not developing or is at a sustainable level [6].

Analyzing the revenues of the telecommunications market of Ukraine, it should be noted that in Ukraine for 2016, revenues from the provision of telecommunications services amounted to 56.96 billion UAH, which is 25.26 billion UAH more than in 2006, that is almost half [3]. This testifies to the rapid growth of the significance of the telecommunication services market not only in the world but also in Ukraine. The main segments of the telecommunications market are mobile communications, Internet communications, fixed telephony and leading Internet communications channels. The analysis of trends in the global telecommunications market allows us to conclude that mobile communications are the fastest growing leading segment. In 2016, the average mobile communications service in the world was used by almost 97 people out of 100, indicating the huge demand from users for this type of service. According to experts' forecasts, in the world per 100 inhabitants from 2017 to 2020 there will be a rapid increase in the use of Internet communications, and the use of mobile communications, fixed-line mobile communications and leading Internet communication channels will remain relatively stable. levels [8].

According to InternetLiveStats data for 2016, the rating of 20 countries of the world is represented by the share of Internet users. The first place in this rating is United Kingdom with a population of 65 million people, of which 92.6% use the Internet. Unfortunately, Ukraine ranked 17th in the ranking with Mexico and the Philippines [14].

In Ukraine and in the world, the need for broadband access to the Internet is constantly increasing. Thus, the number of fixed-line subscribers in the world in 2016 amounted to 884 million, an increase of 8% compared with 820 million in 2015, and it is expected that by 2019, the number of users will increase to 1 billion. In connection with the increase in the significance of SDA in In 2011, the UN recognized in its report the right to broadband Internet access as the basic human right [4].

The main segments of the telecommunications market in Ukraine were and remain fixed-line telephony, mobile communications and Internet access, the total share of which in the total revenue from the provision of telecommunication services for 2016 amounted to 80.3%.

During the last four years, Ukraine has been experiencing a tendency to increase revenues from provision of mobile communication services and services providing access to the Internet. In the period from 2013 to 2016, revenues from the provision of mobile communication services increased by 3111 million UAH,

and from the provision of Internet services by 3669 million UAH. Consumer use of fixed telephony services decreased by 1535 million UAH. This suggests that mobile communications are gradually replacing the fixed telephony market in the telecommunications market.

According to Forbes, the list of the 200 largest companies in Ukraine includes 4 companies providing telecommunication services: PrJSC "Kyivstar", PrJSC "MTS Ukraine" ("Vodafone"), PrJSC "Ukrtelecom" and the PrJSC "Astelit" ("Lifecell") [15].

"Kyivstar" has been and remains the leader in providing telecommunication services. Although the company's profit compared to 2012 in 2016 fell by 1188 million UAH, it continues to lead due to the large part of the market served. "MTS-Ukraine" (Vodafone) does not lose its position on the market either; the company received the largest profit in 2014 in the amount of 3759.34 million UAH thanks to the introduction of new and very user-friendly tariff plans. As for "Ukrtelecom", this telecommunication company received the largest profit in the amount of 444.42 million UAH in 2015 as a result of the introduction of wireless Internet in Ukraine on the market of telecommunication for conditions which are very favorable for consumers. From 2012 to 2015, "Astelit" received losses from its activities. However, after the company changed not only its name to "Lifecell", but also the format of its services, the company's profits in 2016 amounted to 928.3 million UAH. [8].

But the IT industry in Ukraine is developing unevenly. For example, with the development of the Internet, Ukraine is among the leaders, with computerization - in the first twenty. In the field of software, Ukraine is still largely inferior to foreign achievements. Payment systems are still weakly automated in Ukraine. The introduction of software is a direct way to transparent conduction of all financial transactions. However, there are spheres whose automation has been quite active over the past year or two. For example, e-ticket sales became the norm. The tendency to transfer software to the Internet gains momentum. Companies give third parties storage of their databases, while gaining access to them via the Internet. Though, with the convenience of the company, they also receive risk - their information becomes accessible to other interested parties. Consequently, the development of information technology not only promises GDP growth in countries where the industry is actively developing, but also means that modern business must learn to live in new conditions of digital transparency.

The main criteria of the information society are: the quantity and quality of the information in circulation, the efficiency of its transmission and processing, the availability of information for everyone [9]. In Ukraine, there are 66.5 thousand business entities of various forms of ownership, which carry out activities in the field of communication and information. This is stated in the annual report of the National Commission, which carries out state regulation in the field of informatization and communication. At the same time, 280 thousand 400 people work in the field of communication and informatization. In general, ICT workers account for 13% of the average number of service providers, while 33% of IT employees employed in the creation, sale and maintenance of software products designed for customers abroad and for corporate users within the country. This is supported by significant competitive advantages of Ukrainian IT specialists, in particular: the price factor (the salary of Ukrainian programmers can be compared with the income of the Indian and in relation to the American one is 1: 7, while the prices for services from developers from Eastern Europe, on the contrary, are closer to the pan-European ones); a wide spectrum of technological competencies that allows flexible implementation of IT projects of increased complexity (much more complex than Chinese ones); the performers have novelties and a base for the implementation of complex science-intensive projects and provide a shorter period of product release to the market, with flexibility in the use, distribution and interchange of resources, as well as cultural and geographical proximity to Europe [13].

The development of information technology has led to a new turn in the development of the economy. Today, the competitiveness of the economy depends on the ability to use new technologies. Consider the main information technologies that affect economic development and modern social transformations:

Firstly, this is the direction for creating new jobs. The IT sector is and will remain one of the largest employers. For example, in the United States alone, computer and information technology jobs are expected to grow by 22% by 2020, creating 758,800 new jobs.

Secondly, a significant contribution to GDP growth. The results of different countries confirm the positive impact of IT on economic growth. By way of illustration, an increase in the penetration of broadband by 10% is due to an increase of 1.4% GDP growth in emerging markets. In China, this figure can reach 2.5%. Doubling the use of mobile data caused by the increase in 3G connectivity increases GDP per capita and growth rates by 0.5% on a global scale. The Internet accounts for 3.4% of the total GDP in some countries. Also, e-commerce plays an important role.

Thirdly, the emergence of new types of services and industries. Numerous public services have become available online and through mobile phones. Switching to cloud computing is one of the key areas for modernization. IT created the emergence of an entirely new sector in the industry. Studies show that in 2011 Facebook created more than 182,000 jobs, and that the cost of Facebook exceeds 12 billion.

Fourthly, the transformation of labor resources. New "microwork" platforms developed by companies as freelancers. Microwork platforms allow entrepreneurs to significantly reduce costs and gain access to skilled

workforce. In 2012, freelancers alone registered more than 3 million which performed 1.5 million tasks. This has led to the development of online payment systems. IT also contributed to the growth of entrepreneurship, which provides access to best practices, legal and regulatory information, marketing and investment resources.

Fifthly, it is business innovation. In the countries of the Organization for Economic Cooperation and Development (OECD), over 95% of enterprises have Internet access. The Internet provides them with new ways to find customers and compete for a significant market share. Over the past few years, social media has proven to be a powerful marketing tool. ICT tools used in companies help to optimize business processes and increase the efficiency of work. Information and communication technologies have become the main driver of the economic development of any state in the modern global world. Due to the development of IT, almost all sectors of the economy are growing intensively, production and business processes are simplified and accelerated, huge amounts of information are rapidly accumulated and processed instantly, enabling the creation and development of new industries in the economy and in science and technology. ICTs make it easier for users to access the latest databases, enabling the latter to acquire new knowledge and skills, and enhance their own professionalism.

#### Conclusions

Thus, the study of the impact of information technology on the socio-economic processes of the state allows to identify a system of phenomena and problems that are due, as a rule, to the growth of the dynamics of social processes in the information sphere, the intensification of the use of information resources, the intensification of the processes of globalization of the information sector of the state as a factor of institutional transformation. The information sector of the national economy is of great importance for the modern socio-economic development of the state, especially in the context of building an information society. Solving a number of problems that hinder the development of this sector will allow not only to meet the information needs of society, business entities and various sectors of the economy, but also to increase the competitiveness of the country and strengthen the economic position of Ukraine in the world.

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