

## INFORMATIZATION AND INFORMATION TECHNOLOGIES AS A CONSTITUENT PART OF ECONOMIC DEVELOPMENT

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The article examines the impact of informatization and information technologies on the economy of companies, regions and the country as a whole. It has been found out that informatization and information technologies have recently taken a very important place in people's lives; they are becoming an impetus for new and qualitative changes in the world. The analysis of the development of informatization in Ukraine shows that the country has not made concrete steps to support this important area of technology, which affected the pace of its development. The study of information technologies in the national and regional economy of Ukraine is extremely relevant, as they are one of the decisive factors of socio-economic development.

It is difficult to overestimate the importance of informatization: it serves the development of a culture of communication, growth of labour productivity, development of science-intensive industries and high technologies, increases computer literacy, promotes the development of the intellectual potential of the nation and enriches the spiritual life, ensures national interests and improves socio-economic relations.

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## ІНФОРМАТИЗАЦІЯ ТА ІНФОРМАЦІЙНІ ТЕХНОЛОГІЇ ЯК СКЛАДОВА ЕКОНОМІЧНОГО РОЗВИТКУ

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### Ключові слова:

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ІТ, економіка, оцифрування

Досліджується вплив інформатизації та інформаційних технологій на економіку компаній, регіонів, країни загалом. З'ясовано, що інформатизація й інформаційні технології останнім часом посіли в житті людей дуже важливе місце і стали поштовхом до нових та якісних змін у світі. Відповідне інформаційне забезпечення стає необхідною потребою, адже саме зараз інформація разом з наукою та інтелектом людини, що виробляють нові знання, починають поступово змінювати правила сучасного суспільства, надають йому ознак суспільства нового типу - інформаційного. У зв'язку з цим виникає необхідність дослідження системної взаємодії інноваційних та інформаційних чинників розвитку суспільства і визначення механізмів їх практичного застосування. У сучасній Україні інформатизація стає важливою галуззю економіки, визначальною сферою суспільного життя і водночас - найважливішою функцією держави, чинником забезпечення його безпеки і суверенітету. Проведений аналіз розвитку інформатизації в Україні свідчить про те, що досі в країні не зроблено конкретних кроків для підтримки цієї важливої галузі техніки, що позначилося на темпах її розвитку. Надзвичайно актуальним є дослідження інформаційних технологій у національній і регіональній економіці України, оскільки вони є одним із вирішальних факторів соціально-економічного розвитку. Значення інформатизації важко переоцінити: вона слугує розвитку культури спілкування, зростанню продуктивності праці, розвитку наукомістких виробництв та високих технологій, підвищує комп'ютерну грамотність, сприяє розвитку інтелектуального потенціалу нації та збагаченню духовного життя, забезпечує національні інтереси та вдосконалює соціально-економічні відносини.

### Statement of the problem

The informatization of the economy and other spheres of life has become a key socio-economic process in developed countries. It should be noted that the global Informatization of society is one of the leading trends in the XXI century. Due to the rapid increase in the possibilities of informatics, new information technologies, information environment forms and information society develops.

It is extremely relevant to study information technologies in the national economy of Ukraine, as they are one of the main factors of socio-economic development. That is why the study of informatization and information technologies is important, especially their impact and use in the economic sphere should be on focus of modern researchers.

### Analysis of recent studies and publications

In domestic and foreign economic literature, basic research has been carried out concerning the coverage of the principles of formation and features of the functioning of the future post-industrial (information) society. The component of these studies is the scientific heritage of scientists, aimed at studying specific forms of manifestation of the process of informatization of society, its technical, technological and socio-economic aspects, conditions and principles of creation and receipt of information products, means of sale, etc.

Problems of informatization of society are devoted to research of many scientists, such as: V. Davydov, G. Zhavoronkova [1], A. Litvin [2], E. Fomin [3]. However, the question of determining possible problems and prospects for future plans in the domestic environment has not found wide coverage and requires further research.

### Objectives of the article

The purpose of the article is to study informatization as a factor in the development of the information society and to determine the prospects for the development of informatization and information technologies in Ukraine.

### The main material of the research

One of the key conditions for building an innovative economy is the implementation of scaling up the process of informatization society, which is able to guarantee the conditions for the creation and rapid dissemination and implementation of new knowledge, which today is becoming the main driving force of economic and social development.

In a globalized economy, the informatization has become one of the significant factors of increasing the efficiency of modern production, and information resources/technologies are a necessary condition for effective activities in all spheres of life, which together marks the beginning of the transition to a global information society [2]. The main task of the information management system is to subordinate all internal processes and needs of the organization.

The informatization society means constant transformation of the system of resources, conditions and ways of development of information processes, continuous improvement of resources for ordering and development of information and communication

communications. The informatization society is implemented to information activities, which are focused on the formation and use of information resources.

Components of information activities are considered:

- activities related to the creation of an information base (collection, processing, ordering, storage of information);
- activities to transform information resources into information products (software development, research, computer graphics, etc.);
- activities for replication and distribution of information products, providing access to information.

Through a process of information is achieved by coordinating the activities of all subsystems of society: the areas of production, finance, management, education, science, medicine, consumer services, commodity circulation, environmental protection and so on. The informatization business significantly increases the scale of business activity, increasing the level of its stability and competitiveness. The informatization of countries creates the necessary conditions for their proper positioning and position in the world, as well as for the establishment of interstate relations [2].

The introduction of information technology changes the nature of the product. In addition, the introduction of it helps to differentiate goods and services and thereby raise the value of the product for consumption; it changes the nature of business processes, making the production cycle more transparent and controlled; it improves the functioning of the company as a single organism; with the introduction of it, centralized structures evolve into decentralized; the introduction of it leads to rapid changes in the activities of companies: greater predictability of business operations in both production and administration.

Factors of systems' efficiency:

- system integration,
- active IT-management policy,
- human resources.

Research shows that rapid implementation and adequate use of new IT is possible only when the company's staff is interested in it. The joint development of IT- strategy and business strategy contributes to the efficiency of IT systems and the company's activities in general [2]. It is possible to ensure the effectiveness of the corporate IT system if there are complementary components:

- the ability of senior management to recognize the priority of one or another direction of it and use in their daily practice meet the business apps, this specific design of the technological infrastructure of the company, its special information architecture, ensuring free flow of information between different functional areas and departments in a hierarchical structure;
- the special training of company's employees who will directly use information technologies in their workplace.

Empirical studies show that neither IT nor other components of a company's business processes provide a sustainable competitive advantage. Only when optimally combined with human, organizational and technical factors are allowed to win and maintain a stable competitive position in the market. Investments in

information technology have a positive impact on the formation of the company's value and productivity, but only when the necessary complementarity of the accompanying factors is provided. Simply put, the company's IT system is effective if all the necessary conditions are created for its use [3].

Today, Ukraine is implementing numerous reforms through the use of information and information technologies in the social, political and economic spheres. The informatization covers a range of daily and perspective problems-social, economic, organizational, development of culture and education, activity of all links of social management and each link of management separately. In modern Ukraine, the informatization is becoming a significant link in the economy and a key area

of public life, and at the same time a crucial function of the state, a factor in ensuring its security and sovereignty. The digitalization accelerates economic and social processes, making them more efficient and transparent. Nowadays, IT industry of Ukraine generates around 2-3% of GDP. One of the major issues Ukraine encounters today is a lack of digitalization, especially in small towns, where this problem is also aggravated by the lack of computer skills/literacy and information availability to the citizens. According to the International Telecommunication Union, only 49% of individuals use the Internet, while only 56% of households use computers (ITU-T, 2016). Right now, there is a 30% gap in broadband access between the city and village (Digital Agenda of Ukraine, 2016). In Table 1, general information, about the indexes used and what they measure, is provided.

Table 1 - Indexes measuring ICTs development and readiness of Ukraine

Index	Responsible entity	What measures	Ukraine's position
ICT development index 2016	ITU	(1) ICT readiness (the level of networked infrastructure and access to ICTs); (2) ICT use (intensity); (3) ICT skills.	76/175
Networked Readiness Index (NRI) 2016	World Economic Forum (WEF)	(1) Environment for the technology use and creation (political, regulatory, business, and innovation); (2) Networked readiness in terms of ICT infrastructure, affordability, and skills; (3) Technology adoption/usage by the three groups of stakeholders (government, private sector, and individuals); (4) The economic and social impact of new technologies	64/139
Global Innovation Index (GII) 2016	Cornell University, INSEAD, World Intellectual Property Organization	(1) Innovation Input Sub-Index: 1.1 Institutions; 1.2. Human capital and research; 1.3. Infrastructure; 1.4. Market sophistication; 1.5. Business sophistication. (2) Innovation Output Sub-Index: 2.1. Knowledge and technology outputs; 2.2. Creative outputs.	56/128
E-Government Development Index 2016 (EGDI)	UNO	(1) Provision of online services, (2) Telecommunication connectivity, (3) Human capacity.	62/193
E-Participation Index 2016	UNO	(1) E-information: Enabling participation by providing citizens with public information and access to information without or upon demand; (2) E-consultation: Engaging citizens in contributions to and deliberation on public policies and services; (3) E-decision-making: Empowering citizens through co-design of policy option and co-production of service components and delivery modalities.	32/191

Source: compiled by the author, based on: [4, 5].

We have checked and compared Ukrainian positions in a number of international rankings with the selected countries that have a different level of development (Poland, Georgia, Russia, Germany) to provide a general overview of ICTs development trends, usage and application among countries (Table 2).

Table 2 - Indexes comparison within the selected countries

Index/Country	Ukraine	Poland	Germany	Georgia	Russia
<b>ICT development index</b>	5,33	6,65	8,31	5,59	6,95
ICT access	5,58	7,09	9,09	6,29	7,23
ICT use	2,57	5,35	7,49	4	5,87
ICT skills	8,57	8,35	8,36	7,34	8,55
<b>EGDI</b>	0,60	0,61	0,72	0,82	0,72
Online Service Index	0,58	0,64	0,84	0,70	0,73
Telecommunication Infrastructure Index	0,39	0,42	0,73	0,58	0,61
Human Capital Index	0,84	0,77	0,88	0,87	0,82
<b>E-participation Index</b>	0,75	0,88	0,76	0,56	0,75
<b>The Networked Readiness Index</b>	4,17	4,50	5,55	4,25	4,54
<b>The Global Innovation Index (GII)</b>	35,7	40,2	57,9	33,9	38,5

Source: compiled by the author, based on: [4, 5].

The Strategy of Information Society Development in Ukraine-2020 sets the following targets for our country: WEF Networked Readiness Index – 40th place, UN e-Government Index – 50th place, the Global Innovation Index (GII) – 40th place. A comparison of different indexes and their composites shows that Ukraine has rather poor positions in terms of information telecommunication infrastructure development, our positions are worse than those of Georgia and Russia (Table 2). However, our country has one of the best positions in terms of human capital development and skills, which has to do with the transformations of the national education policy (an increase of government orders for ICT specialties), encouragement of public-private partnership, implementation of basic programming class in high school, etc.

It is worth mentioning that right now Ukraine is in a situation with the maximum digitalization of international economies by Ukrainian IT companies/ specialists and

minimum digitalization of our own economy since many talented developers choose to work for the international market. Moreover, the brain drain has been a sad tendency in Ukraine since around 10 000 IT specialists have already left the country in 2016, while it is estimated that one developer generates around 1 million dollars “product” he/she produces, which works for the international market instead of the national one (Digital Agenda of Ukraine, 2016).

Obviously, we cannot talk about successful implementation of the smart cities concept till we fully digitalize the country, laying the necessary foundation. Moreover, the country should deal with the digital gap between smaller cities (suburbs) and centres, as well as between people of different ages, backgrounds, incomes, etc. Below, the key drivers of the current stage of digitalization worldwide along with the opportunities and challenges they impose on Ukraine are outlined (Table 3).

Table 3 - The main trends in the digital world, Ukrainian aspect

Trends	Opportunities	Challenges
Data becomes the main driver of the competitiveness.	1) Development of new industries; 2) New jobs creation; 3) Establishment of the effective governance and anti-corruption tool.	1) Lack of regulations, standards, skills and experience for collection, storage and usage of data; 2) Intellectual property issues; 3) Cyber Security risks;
Active spreading and usage of “Internet of things” concept.	1) Increase of efficiency for many sectors of economy and business processes in general; 2) Investment attraction; 3) Incremental and transformational innovations.	1) Lack of awareness and experience in this area; 2) Start-ups are orientated to external market; 3) Lack of professionals and unprepared education system.
Emergence and spreading of new business-models that belong to “shared economy” business model	1) Easier start for new businesses (no big investments are necessary); 2) Easier launching of internet projects, creation of new market places, expansion of consumer markets for Ukrainian products and services;	1) Financial barriers for Ukrainian companies that work on international markets (smooth money transfer to accounts opened in Ukraine); 2) Legal obstacles.
Virtualization of physical IT infrastructure and switching to service models (usage of cloud services and software defined architecture).	1) Fast and cheap way to install and use the necessary digital infrastructure for business/ government/society; 2) Effective infrastructure building for the whole country.	1) Lack of legislation for cloud services; 2) Lack of strategy; 3) Lack of the local cloud service providers of the highest security level.

Source: compiled by the author, based on: [6].

### Conclusions

The development of new technologies creates objective circumstances for the transition to a new innovation and information economic regime in all economic spheres and industries is extremely important, but the winners are usually countries and large corporations that already control the process of creating new technologies and want

to lead the main world markets, where they plan to implement the system created using the latest information systems and technologies. Ukraine still has negative trends, despite the number of reforms related to informatization and its influence. The actual directions of further development of this problem are the search for ways to improve the efficiency of information technology.

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