

# Digital Technologies as a Basis for the Development of a Modern Enterprise

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**Abstract**—The current period of society's development is highly influenced by digital technologies which penetrate all spheres of human activity. Russia is currently entering a new level of development, like many developed countries. This development is based on the use of IT-technologies, caused by the Fourth Industrial Revolution. Digital technologies offer great development possibilities for an enterprise. Due to modern technologies the performance of firms, companies, enterprises and organizations became more productive and easier. At the same time, domestic enterprises lag far behind foreign ones to use IT-technologies in the production and sale of products and services. It is of particular significance for small businesses, which due to objective and subjective reasons are not able to implement digital technologies in full. Undervaluation of the use of new technologies by enterprises can lead to the loss of competitiveness both in domestic and foreign markets of goods and services. In the coming years, we can see the development of digital technologies in the following areas: Internet of Things, Augmented Reality, Virtual Reality, Internet of Things, Machine Learning, Artificial, 3D printing.

**Keywords**—*Digital Technologies, IT- Technologies, Development of an Enterprise.*

## I. INTRODUCTION

Digital systems are becoming very popular at enterprises. Digital technologies refer to the technologies that use electronic computing equipment to record code pulses in a certain sequence with a certain frequency [1]. Their development offers great opportunities. Digital technologies are applied primarily in computers, robots, management systems, telecommunications (e.g., cellular telephone system), measuring devices and equipment for digital recording and reproduction of images and sound (e.g., DVD and CD). Digital equipment is often easier to maintain and it provides better quality than analog.

Digital technologies make it possible to perform many diverse tasks in the shortest period of time. The high speed and versatility of this scheme have made IT-technology so popular. Digital technologies make it possible to speed up different industrial processes using ultra-precise measurement methods. Use of information systems allows to make large volumes of production in the shortest terms and to sell it worldwide. Automation of work processes within companies allows to keep financial records, based on actual statistics. Using the experience of management optimization allows to diversify production and make more rational decisions during the activity. Thus, expanding the boundaries of possibilities, modern digital

technologies help to increase the pace of economic development.

## II. LITERATURE REVIEW

Business corporations are at different stages of the implementation of IT-methods of management and communications. Over the recent years the attention of the largest technology-based corporations is focused on the Fourth Industrial Revolution – «Industry 4.0». The Fourth Industrial Revolution means the increasing automation of absolutely all processes and production stages: the digital product design, the creation of its virtual copy, the joint work of engineers and designers in the common digital design office, the remote configuration of equipment at the plant, the online order of the necessary components in the quantity needed, the control of their supply, the tracking of the finished product from the warehouse to the store and to the end user. Even after the product has been sold, the manufacturer continues to monitor the conditions of its use; he can change the settings remotely, update the software, warn the customer about the possible breakdowns, and at the end of the cycle of use — take the product for its recycling. One of the pioneers of digital technologies and the main ideologist of the concept of the «Industry 4.0» was Germany, which in 2011 officially presented the state strategy under the same title [2].

In July 2015, in France it was established the Alliance for the Industry of the Future (Alliance pour l'Industrie du Futur), which brings together different organizations from the private sector, the scientific environment and the number of state institutions [3]. In the UK a new digital strategy (UK Digital Strategy) was officially published in 2017. [4]. In Japan, the main government document defining the long-term goals and objectives of the country in the field of digital technology development is called Smart Japan ICT Strategy, officially published in June 2014. [5]. The European Commission released a new integrated initiative under the interim title «Digitalsing le market – digitising European industry», which sets out a series of new tools and mechanisms to support further digitization of the European industry and service sector [6]. In 2017, Russia set a course for digitalization and adopted the programme «Digital Economy of the Russian Federation». It identifies the primary areas of the introduction of digital technologies into the economy [7].

**III. METHODS**

Let's study the basic indicators characterizing the development of digital technologies at enterprises [8]. The analysis of the IT sector share in the gross added product for 2015 has shown that the Republic of Korea topped the list. The contribution is 10.7%. The IT sector in Japan, Ireland and Sweden contributes about 7%; in the USA – 5.9%; in France, Denmark and Spain about 4%. In Russia, the share of the gross added product of digital technologies contributes 2.8%. According to research carried out by the Russian Association of Electronic Communication (RAEC), the contribution of the digital economy to Russia's GDP in 2017 was only 2.1% [9, 10], in light of this a more detailed study is needed.

The analysis of the use of the broadband Internet by enterprises in different countries has shown that Russia occupied a lower position on this indicator than other countries. Lithuania, the Netherlands, Finland have a 100% level. Republic of Korea, Denmark, Slovenia use the Internet for 99%. Russia has an indicator equal to 76%.

The analysis of the enterprises with Websites also reflects the existing problems in the Russian organizations. While in such countries as Finland, Denmark, Sweden, the Netherlands, Germany, Japan, the share of the enterprises using websites is about 90%, then in Russia this rate is 41% only.

The situation is slightly better in using «cloud servers» by Russian enterprises. In Finland, this figure is 53%, in Iceland, Italy, Sweden is about 40%, in Russia – 18%, in France – 12%, Germany – 11%.

The analysis of the basic indicators of IT-technologies development at the Russian companies is presented in the Table 1.

TABLE I. THE BASIC INDICATORS OF IT-TECHNOLOGIES USE IN THE RUSSIAN COMPANIES (%)

	2012	2013	2014	2015
Servers	21.5	22.2	28.4	53.8
Global information networks	87.4	87.9	88.5	86.8
E-mail	85.3	86.0	83.6	82.7
Web sites	38.7	40.5	39.8	41.4
Electronic data interchange	23.1	24.1	53.1	59.2
"Cloud" services		11.0	13.8	18.4

We see that over the recent years the use of servers has significantly increased: compared to 2012, the number of servers has increased by almost 2.5 times. The number of Websites has slightly increased and amounted to 41.1% in 2015. Electronic data exchange between enterprises increased significantly, from 23.1% in 2012 to 59.2% in 2015. The analysis of enterprises using IT-technologies in different economic sectors makes it possible to conclude that the servers are used most often in the financial sector (63 %), in the business sector – 53.8%, in the public administration – 49.6%, in the social sec-

tor – 41.7%. The financial sector is also the leader in the number of websites (61.6%), public administration uses servers for 48.3% , social enterprises – 41.7%, the business sector – 41.4%.

The analysis of the IT technologies use by ownership forms is presented in the Table 2.

TABLE II. THE BASIC INDICATORS OF IT-TECHNOLOGIES USE IN THE RUSSIAN COMPANIES BY OWNERSHIP FORMS (%)

Form of ownership	Web-sites	Internet	Servers
State	51.2	94.8	62.7
Private	43.0	81.3	53.9
Foreign	61.2	91.6	64.8
Mixed	52.5	87.0	58.6

According to the Table 2 the foreign-owned enterprises are considered to be more advanced in using IT technologies. Generally, it can be considered predictable. State-owned enterprises also have quite good indicators. In our view, the reasons for this is the programme of informatization of society and public services carried out in the Russian Federation. The private enterprises have the worse situation. It can be linked, on the one hand, with the lack of financial resources of the enterprise, and on the other hand, with the lack of understanding of the role of IT technologies for the development of the company in the future. The cost savings on the use of digital technologies may reduce the competitiveness of these companies on the domestic and world markets in the future. It also can be noted that with the growth of the average number of employees in the company, the percentage of the use of digital technologies increases too. If only 30% of websites and servers are used at the enterprises with up to 50 employees, then 55% of websites and 65% of servers are used at the companies with more than 50 people. Most attention to IT technologies is paid by the large-scale enterprises: their share of websites and servers is 85% and 96%, respectively.

**IV. THE RESULT**

The study makes it possible to conclude that the use of digital technologies is the calling of our time. Most developed countries have embarked on the introduction of IT technologies in different areas. Russia is also taking measures to develop digital technologies in different activities, but their share in the gross domestic product is quite low so far. It is necessary to implement broadband Internet by enterprises in full, to develop websites, to continue using "Internet servers", to increase electronic data exchange between different structures and companies.

At the same time, it can be noted that private sector enterprises, especially small businesses, underestimate the need to introduce the digital technologies. Such a position could lead to the loss of competitiveness both in domestic and foreign markets.

**V. DISCUSSION**

In the coming years, we can see the development of digital technologies in the following areas, which will become the basis for the development of enterprises:

- Internet of Things (IoT) is the interaction of things not only with a man, but also between each other. This area can be used on conveyor lines, in the systems of repair and maintenance of the equipment, in logistics and many other areas of business.

-Augmented Reality (AR) allows you to bring objects from the virtual world to the reality. Virtual mirrors and fitting rooms are widely distributed in shops selling clothes, augmented reality is already being tested in cars.

- Virtual reality (VR). These technologies are less used in business, it is now in demand 3D-modeling technology. The examples of the digital 3D models of the real world objects include construction companies, construction manufacturers of complex technical products, oil production, and other branches.

- Internet of Things (IoT) is the connection of physical objects to the Internet, which allows for the collection of information and even remote control of these objects. In fact, a virtual copy of the physical object appears on the Internet, containing various parameters of the object and the outside world, and allows you to manage the object through the Internet.

- Machine Learning (ML) and Artificial Intelligence (AI) are such computers that have elements of artificial intelligence, which is more powerful than a human in some areas. This could include a translation, a speech recognition, the algorithms for searching the right solutions. Many professions will remain in the past.

- Robotics is the replacement of simple functions performed by people in the workplace, which allows to reduce the number of errors and to speed their execution. Robotics is already used in assembly lines and in logistics, which makes it possible to achieve economic efficiency from their application.

- 3D printing can change the construction and engineering industries. The production of 3D printers that can print items made from polymers, concrete, metals and even gold, changes the very understanding of the production cycle, because many of the products can be produced at home, having only a three-dimensional model and a 3D printer.

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