



DIGITAL ECONOMY: CONCEPT AND DEVELOPMENT TRENDS

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Annotation: *The Digital Economy is an economic activity focused on digital and electronic technologies. This includes e-business and commerce, as well as the goods and services they produce. Essentially, this definition covers all business, cultural, economic and social transactions carried out on the Internet and through digital communication technologies. The following article is devoted to the study of digital economy and its development trends.*

Key words: *digital economy, cloud technology, bitcoin, cryptocurrency, e-commerce, internet of things, web money, Qiwi wallet.*

INTRODUCTION

The term was first used in *The Digital Economy: Promise and Danger in the Age of Network Intelligence* by author Don Tapscott. Over the past 15 years, the growth of the Internet economy has been especially noticeable. There has been a huge growth in digital platforms. Consumers are increasingly influenced by what they see on Facebook, Twitter, Instagram or YouTube. The Internet is integrated into all aspects of human life, including indispensable structures such as healthcare, education and banking. The digital economy is an economic activity in which digital data, processing large volumes and using the results of analysis are the key production factor which, compared with traditional forms of management, can significantly increase the efficiency of various types of production, technologies, equipment, storage, sale, delivery of goods and services.

In other words, the digital economy is an activity directly related to the development of digital computer technologies, which includes services for the provision of online services, electronic payments, online commerce, crowdfunding, and so on. Usually the main elements of the digital economy are called:

e-commerce, internet banking and electronic payments, cryptocurrency and blockchain,

Internet advertising and online games.

The digital economy is a production based on digital technologies. Currently, about half of the world's population uses the Internet in their daily lives for learning and doing business. The volume of virtual trade in the near future will exceed the standard types of trade relationships. Digitized money is more convenient to use, it is much more difficult to fake it.

Virtual life is an industry where new products are made and the craziest ideas are realized. Testing new inventions has become more accessible and faster - there is no need for real tests. Emulation allows you to identify the pros and cons of new products at minimal cost. The electronic economy, according to experts, will completely change the usual business processes and economic relationships.



The digital economy is an activity in which the key factors of production are data presented in digital form, and their processing and use in large volumes, including directly at the time of their formation, makes it possible to significantly increase efficiency, quality and efficiency compared to traditional forms of management. Productivity in various types of production, technologies, equipment, storage, sale, delivery and consumption of goods and services.

MATERIALS AND METHODS

An example of a digital economy is any economic activity implemented via the Internet. Digital can be called any company that seeks to fully or partially transfer its activities online. If such important aspects of functioning as management, control and analysis of business, provision of services or delivery of goods, logistics and marketing are associated with electronic technologies in an enterprise, then such a company can be counted among those that form the electronic economy.

For example, Uber or Yandex Taxi are definitely technology companies based on advanced customer interaction technologies. As a result, the consumer received a radically new type of service provision with lower organization costs, which led to cheaper taxi fares.

It also happens that a completely traditional company is moving to a digital economy. In particular, this was the case with the supermarket chain. When the administration realized that almost 70% of the resources are spent on maintenance, it launched a digital transformation with an IBS partner and switched to new technologies, which improved the business model.

Benefits of the digital economy

The digital economy, namely the emergence of new opportunities, of course, has a positive impact on human life.

Thanks to the development of digital technologies, the consumer can quickly receive the services he needs, save money by buying products in online stores at lower prices. So, the electronic version of the book will cost you several times cheaper than its printed counterpart, on wholesale purchases on the Internet, by agreeing with other consumers, you will save more than shopping at offline outlets. After all, the consumer can even start a business online, become an entrepreneur without leaving home.

Other advantages of the development of the digital economy, the World Bank in its 2016 review "Digital Dividends" include:

- growth in labor productivity;
- increasing the competitiveness of companies;
- reduction of production costs;
- creation of new jobs;
- overcoming poverty and social inequality.

And these are just a few examples of how the digital economy has a positive impact on our lives, giving many opportunities to the average user, and thereby expanding the possibilities of the market itself.

Disadvantages of the digital economy



The introduction of “digits” and e-commerce, however, carries a number of disadvantages for humanity, including:

the risk of cyber threats associated with the problem of protecting personal data (partially the problem of fraud can be solved by introducing the so-called digital literacy);

"digital slavery" (using data on millions of people to control their behavior);

an increase in unemployment in the labor market, as the risk of the disappearance of certain professions and even industries will increase (for example, many experts seriously believe that the banking system will disappear within the next ten years). This will become possible due to the further spread of information technology and its products, such as: stores with electronic cash registers, customer service bots, unmanned vehicles, etc.);

"digital divide" (a gap in digital education, in terms of access to digital services and products, and, as a result, a gap in the level of well-being of people in the same country or in different countries).

Technologies shaping the digital economy

Almost the entire layer of modern information and communication technologies has some relation to the digital economy. We will highlight only five technologies that are the most important.

Cloud computing

Cloud Computing is an information technology concept that provides ubiquitous and convenient network access on demand to the total amount of configurable computing resources that can be quickly provided and released with minimal operating costs or requests to the provider.

In the everyday sense, cloud technologies are access to remote data storages and remote computing resources that are provided to the user on demand and in the required amount.

Examples of resources include data networks, servers, storage devices, applications, and services, either collectively or individually. In other words, cloud technologies are data processing technologies in which computer resources are provided to an Internet user as an online service.

This concept appeared in 2006 and is rapidly playing an increasingly significant role in practice: the public cloud computing market has grown from \$17 billion in 2009 (about 5% of the entire information technology market) to \$175 billion in 2014. Cloud technologies have a large number of advantages compared to the classical IT architecture:

saving on computing power;

fault tolerance;

high data processing speed;

savings on licenses and software;

cheap server space;

accessibility (limited only by the presence / absence of the Internet);

resistance to DDOS attacks.

It must be said that cloud technologies have made a colossal, if not decisive, contribution to the foundation of the digital economy. This contribution is not limited to



the technological component, but also includes economic and ideological components. The development of cloud technologies, for example, has led to the emergence of such concepts as production on demand (production on-demand), software as a service (software as a service) and many others, which have become the leitmotif of most business models and the principle of economic interactions in digital economy.

Big Data is a set of approaches, tools and methods designed to process structured and unstructured data (including from various independent sources) in order to obtain human-perceptible results. Big data is characterized by a significant volume, variety and update speed, which makes standard methods and tools for working with information not effective enough.

Thus, Big Data technology is a decision-making tool based on large amounts of information.

This area of information technology has been actively developing since 2010. Today, there are many methods and complex software products that allow you to process Big Data, including those from IBM, Oracle, Microsoft, Hewlett-Packard, EMC, Apache Software Foundation (HADOOP), etc.

Examples of information sources that require big data techniques include:

- logs of user behavior on the Internet;
- GPS signals from cars for a transport company;
- information about transactions of all bank customers;
- information about all purchases in a large retail chain;
- information from numerous urban IP-cameras;
- information from sensors of large production, equipped with industrial Internet technology, etc.

The number of data sources is growing rapidly, which means that data processing technologies are becoming more and more in demand.

The Internet of Things (IoT) is a concept that combines many technologies, which implies equipping with sensors and connecting all devices (and things in general) to the Internet, which allows real-time remote monitoring, control and management of processes (including in automatic mode).

Today, two major areas have been formed:

Internet of things (IoT - Internet of Things),

Industrial Internet of Things (IIoT - Industrial Internet of Things).

Instrumentally, these technologies are very similar, the key difference is in their purpose: if the main task of the Internet of Things is to collect all kinds of data (which will be used as a priority for building models and forecasts), then the purpose of the industrial Internet of Things is to automate production (due to remote management of resources and capacities for sensor readings).

Cognitive technologies

The name comes from the word *cognitio* (lat. “to know”), that is, cognitive technologies are technologies that “work” with our knowledge: they evaluate our attention, track our state, monitor the work of the brain and try to “understand” a person.



The most promising areas for the development of these technologies are:
cognotropic drugs designed to expand human capabilities, including the development of intelligence, memory;

cognitive assistants - adaptive support systems in various situations (access control, autopilot);

virtual interfaces of the "brain-computer" type - intuitive, accessible to everyone ways to control computer systems.

The development of cognitive technologies and knowledge about the structure of the human brain will help us in the development of artificial intelligence. It is necessary to distinguish between full-fledged Artificial Intelligence, which has almost unlimited possibilities and enslaves humanity in many science fiction films, and intellectualized systems, which are the evolutionary development of cognitive systems. True artificial intelligence at the moment is the subject, rather, of philosophical disputes about the fundamental possibility of existence and potential danger.

Intelligent systems can be seen already now, a striking example is the Watson supercomputer from IBM. Already, the Watson cloud-based cognitive system allows you to conduct automatic dialogues with users on the website of the USAA company (financial services for the military), makes decisions at WellPoint (a medical insurance company in the United States).

Virtual (digital) currency

Electronic currency is money that does not have a material embodiment, which can be used as a full-fledged banknote.

Cryptocurrency

This is a type of virtual currency, the emission ("mining", mining) of which is based on the specific application of cryptographic algorithms.

Blockchain (distributed ledger, chain of transaction blocks)

BlockChain is a methodology for building distributed databases (without a single center), in which each record contains information about the history of ownership, which makes it extremely difficult for it (information) to be falsified.

Blockchain is used in virtual currency systems to perform operations (issue of monetary units, transfers) and store their history.

bitcoin

Bitcoin (BTC) is the first and most widely used virtual currency in existence; is a cryptocurrency and uses Blockchain technology.

We could not ignore these concepts, since they are really related to the digital economy, firstly, and secondly, recently there has been a misunderstanding and mystification of the indicated terms. However, let's say right away that the importance of these tools in the digital economy is exaggerated. In fact, this is a very wide range of issues, but we will try to outline their essence as simply and briefly as possible.

Virtual currency may not be a cryptocurrency and may not use Blockchain technology. Examples of virtual, but not cryptocurrencies, are Yandex money, Web money (WebMoney) and Qiwi wallet (Qiwi).



Many people confuse the terms virtual currency, cryptocurrency, blockchain and use them as synonyms, but this is true only for the first virtual currency - Bitcoin. The fact is that blockchain technology was developed specifically for Bitcoin and was not used anywhere else for some time, but today this is no longer the case. Due to its features, which we will discuss below, blockchain technology is finding more and more applications: copyright, vote counting, crowdfunding initiatives, social authority, insurance, advertising, betting, etc.

Without going into the essence of technologies and algorithms, we list the main distinguishing features of Blockchain technology:

data is repeatedly duplicated and stored in a distributed network created and supported by all participants, which makes it practically impossible to hack it;

each information record contains its own background, which makes it possible to verify the origin of information and its authenticity;

features of the database construction make it extremely resistant to hacker attacks or illegal actions.

The listed features of blockchain technology determine the main property of cryptocurrencies:

- reliability;
- impossibility of falsification;
- the impossibility of theft or "freezing, stopping" the transaction.

It is also necessary to note the following features of classical cryptocurrencies:

lack of a single emission center;

Limited emission (the number of cryptocurrencies is limited, for example, bitcoin has a limit of 21 million);

open source code;

lack of external regulation (apart from that laid down in the program code);

cross-border.

CONCLUSION

In addition to reliability, cryptocurrencies attract users with ease of use and minimal transaction costs. The cost of Bitcoin (like any other cryptocurrency) is determined on special exchanges (crypto-exchanges or virtual currency exchanges). In other words, many virtual currencies do not have a material backing, but are a form of social contract.

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