World Scientific News

An International Scientific Journal

Cloud technology in market

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ABSTRACT

This work is devoted to one of the most promising and dynamic segments in the information technology market - cloud computing. The information technology sector plays a significant role in the world economy. To date, the study of the IT market and its segments is one of the most relevant topics. Experts pay special attention to cloud technologies. The work describes in detail the structure of the IT market, conducted a study of its elements, including cloud technologies, will affect the development of the global information technology market. Within the framework of the research, the analysis of prospects and development of the cloud technology segment in various social spheres, including education, business, leisure, was conducted. Various sources, including foreign ones, were used in the work.

Keywords: information technologies, cloud technologies, cloud, third platform, global IT market, cloud technologies in education, analysis and development prospects

1. INTRODUCTION

Information technology does not stand still, it is believed that the IT industry is the most rapidly developing in the world. Every day experts from all over the world create new technologies and innovations that can make our life easier and bring something new into it. The IT industry is the engine of economic growth for the world as a whole, and for individual states. Many countries saw the possibilities of information technologies to bring high dividends to the economy of the country and began to develop large-scale strategies aimed at increasing the role of information technologies in the country's economy. Increasing the efficiency of providing services to society in a variety of spheres, such as health, safety and education, information technology allows to achieve greater social stability in the state. All this led to an increase in demand for information services around the world.

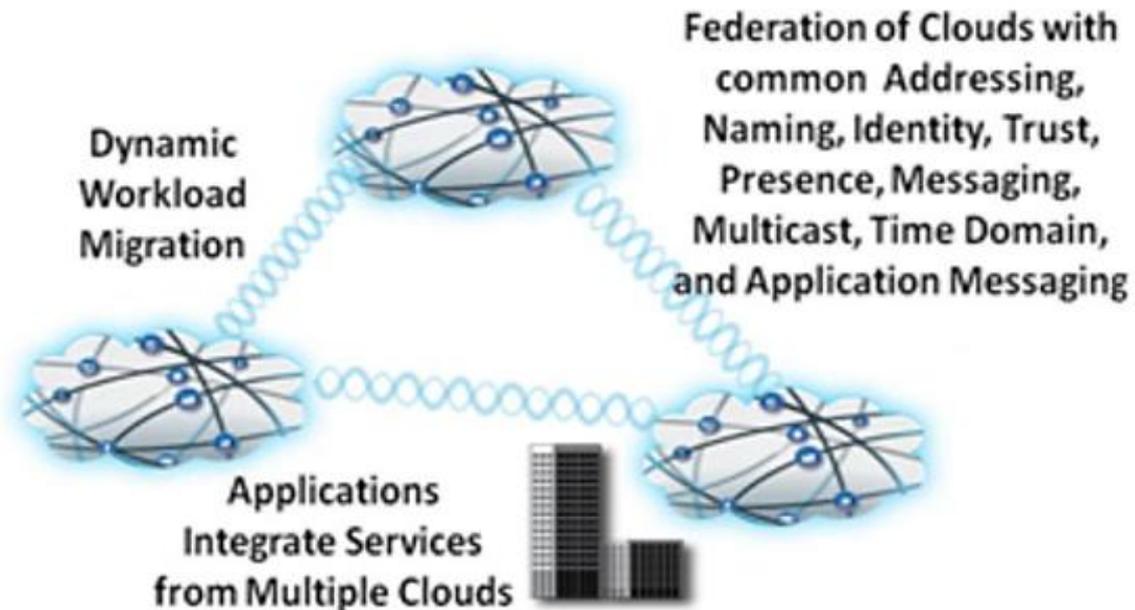## 2. LOGICAL EXPANSION AND PROGRESSION OF THE GLOBAL IT MARKET

Figure 1. The inter cloud vision

(Bernstein, David, Deepak Vij, and Stephen Diamond. "An intercloud cloud computing economy-technology, governance, and market blueprints." SRII Global Conference (SRII), 2011 Annual. IEEE, 2011).

The increased demand led to the logical expansion and progression of the global IT market. A big leap in the development of the IT market occurs in 2016, when information technology is the first in terms of the speed of evolution and growth in popularity compared to other sectors of the economy. The importance of the market for information and communication technologies for society increased with geometric progression. Figures for growth are statistics for 2016-2017 - despite the global economic crisis, the number of users

with access to the Internet has grown to 422 million people, and the number of mobile phone and smartphone owners has reached 4 billion people - this is a huge figures.

Now the world IT market continues to develop and does not cease to be the most dynamic in the world, it still plays a high role for modern society and its impact on people is only increasing.
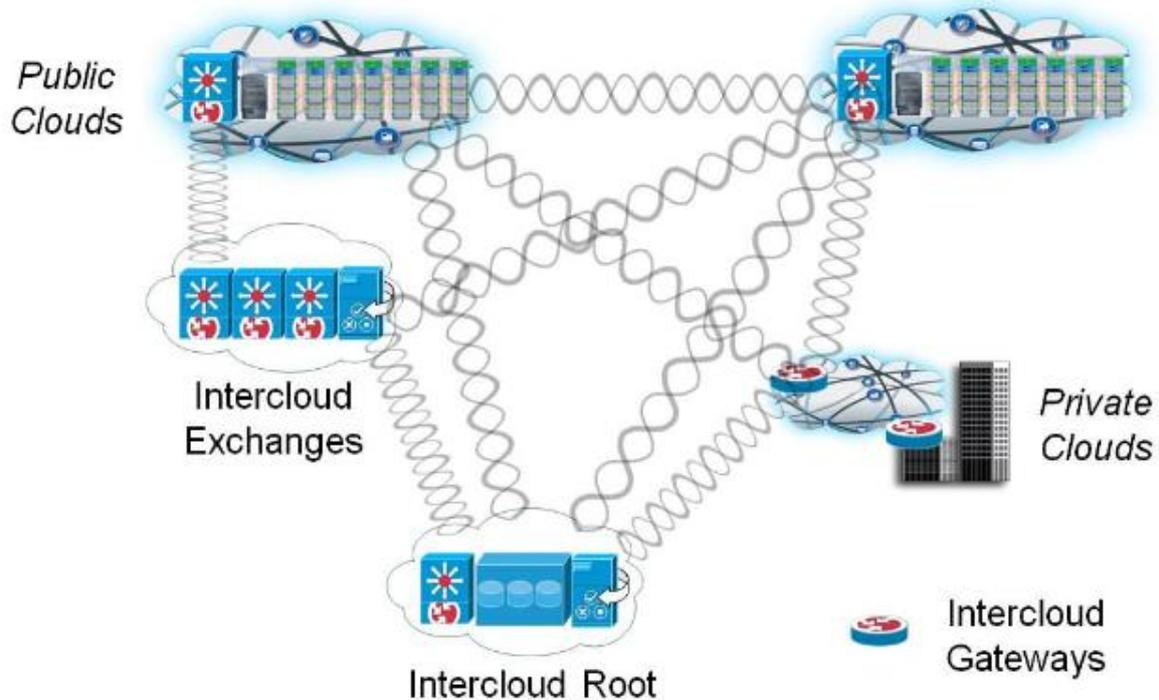

Figure 2. Reference Intercloud topology and elements

(Bernstein, David, Deepak Vij, and Stephen Diamond. "An intercloud cloud computing economy-technology, governance, and market blueprints." SRII Global Conference (SRII), 2011 Annual. IEEE, 2011).

In order to learn more about trends in the development of the global IT market, it is necessary to understand what it is. To date, there is no clear interpretation of the concept of the information technology market, many IT analysts and experts find it difficult to define this term, and if this is the case, the opinions of experts in most cases differ. This is because experts can't determine the precise structure of this market. It is believed that the IT market is one of the three components of the ICT market (the market of information and communication technologies) and closely intersects with the telecommunications market.

It is customary to distinguish between three and four industries in the IT market, and the opinions of experts differ here. Experts from the International Telecommunication Union (ITU) argue that the IT market includes three industries, namely:

–   the field of computer hardware;
–   services in the field of software and computer support;
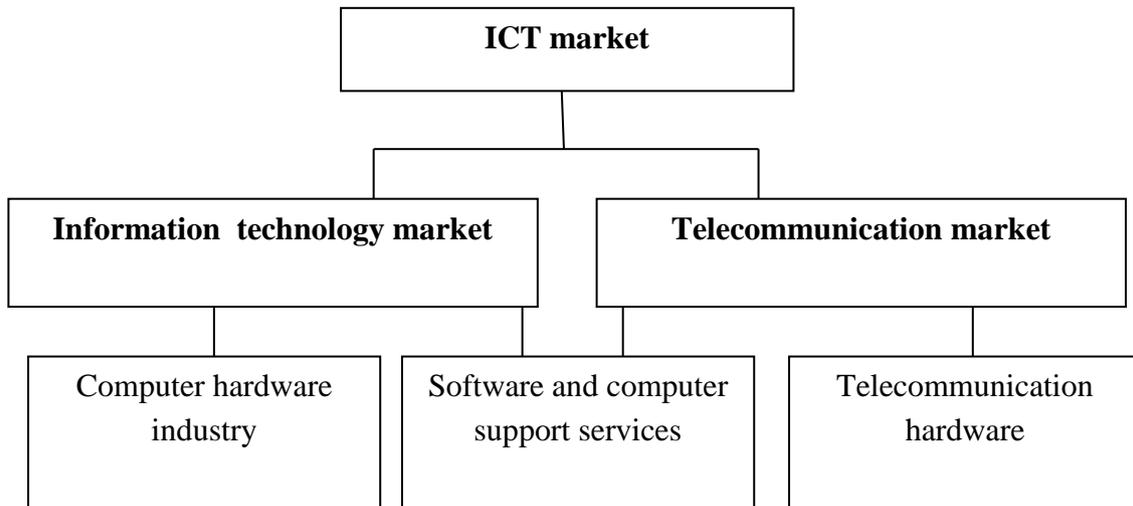–   telecommunication hardware;

Figure 3. The structure of the ICT-market in the interpretation of ITU
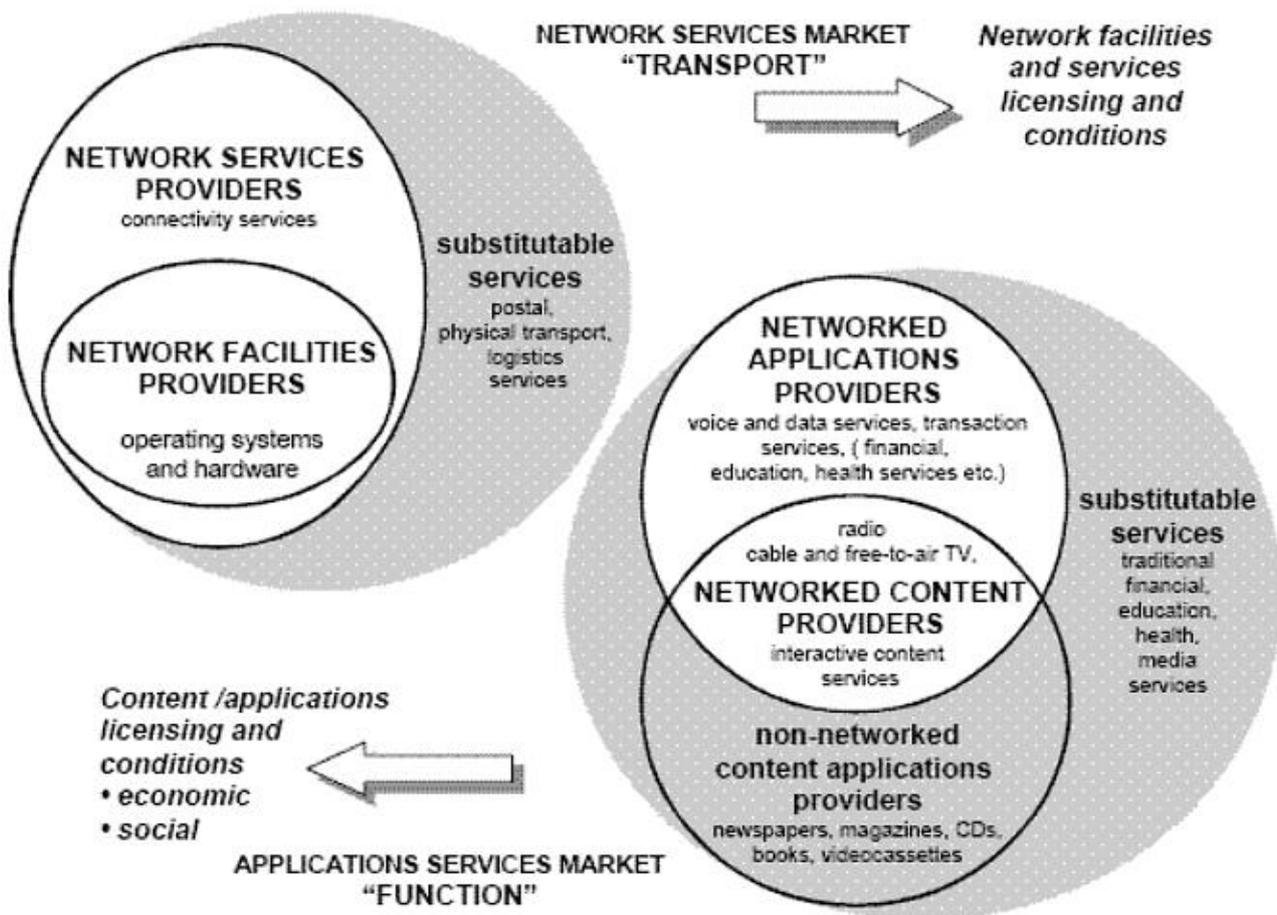

Figure 4. The structure of the ICT-market services "FUNCTION"

Another opinion among analysts from the International Research and Consulting Company (IDC), according to their understanding of the market, in its structure includes:

– servers, clients and storage systems (storage systems);
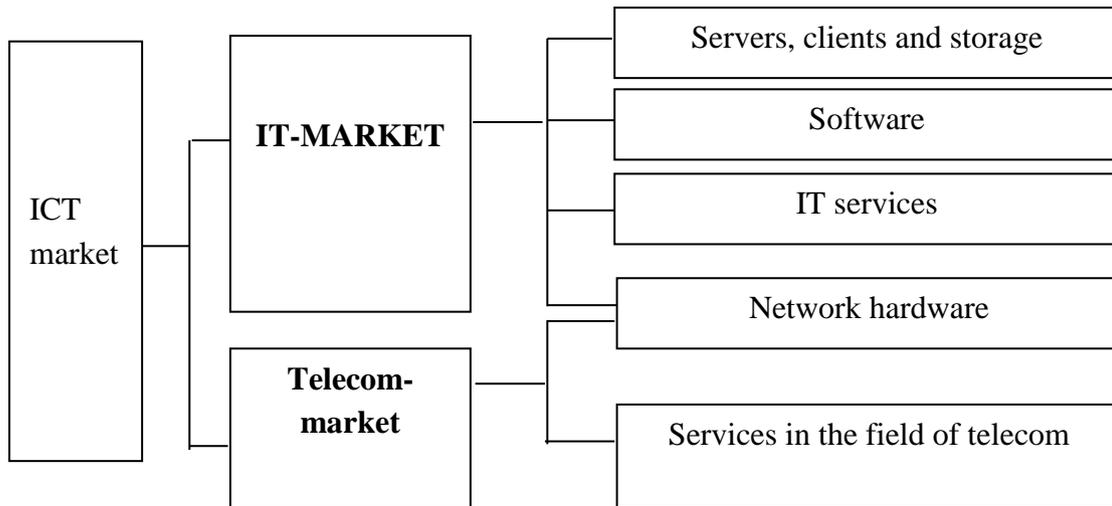– software;
– IT services;
– network equipment.

Figure 5. The structure of the ICT market in the interpretation of IDC

3. SEGMENTS OF THE INFORMATION TECHNOLOGY

The percentage of all segments of the information technology market, different experts and analysts determine, depending on the conditions in the market of a certain state. Unlike the national IT-markets, the world has long had stable statistics, reflecting the ratio of all its segments. According to information provided by IDC in 2016, the largest branch in the world market is equipment that includes various equipment, for example: laptops, printers, televisions, smartphones, tablets, etc.

Despite the rapid drop in sales of desktop computer equipment (PCs, laptops, monitors), the hardware and equipment segment has long been a cost-leader in the global IT market and does not cease to be, experts believe that this trend is prompted by the rapid growth in the popularity of mobile technologies . The whole world began to actively buy tablets, smart phones and smart watches, rather than laptops or personal computers.

The most stable products in this segment are printing and copying equipment, the demand for them does not fall more than 10 years. Now the cost of IT equipment occupy almost 50% of the total volume in the global information technology market. The fastest growing and dynamic segment in the IT market is the software industry. For several years, software sales have been growing steadily. According to IDC, its annual growth reaches 6%.

More than half of the total segment volume is formed by applications of various types and destinations, most of which are mobile applications, sales of which are growing due to the widespread development of mobile technologies. The smallest part of the software segment

consists of corporate software and various development tools, for example, integrated development systems such as Microsoft Visual Studio or a system for creating multimedia content. Corporate IT systems, which are very popular among companies, interact with databases, which in turn creates a demand for programs that support the operation and management of databases. Also, a significant share in this segment is the system software. A very important segment in the IT market is IT services and IT outsourcing.

The growth of information volumes requires significant expenses for the improvement of information systems and corporate data warehouses, therefore companies are increasingly resorting to the services of third-party organizations that provide outsourcing services to support and maintain information systems and programs. Now, IT outsourcing, that is, transferring functions to support and service corporate IT infrastructures, is one of the popular and sought after directions in the market. One of the most promising areas in the global information technology market today is cloud technology.

They are a technology that does not require the use of a local server or computer and is performed remotely, for example via the Internet. Cloud technology consists of a large number of servers located in the data center. "Clouds" provide resources and unlimited platforms for placing data of a huge number of software products around the world [4]. This technology has gained special popularity among enterprises and organizations. Enterprises around the world are actively using "clouds" to save resources, the technology allows them to save on the deployment of their own ERP-systems (Enterprise Resource Planning) or CRM-systems (Customer Relationship Management System), the content of which requires significant costs. Many services provide free space from 1 to 26 gigabytes. If the user wants more space, then he will have to increase capacity for money. For example, a Dropbox provider will have a storage capacity of about 50 GB of memory per year [4].

Also, along with cloud technologies, experts believe that the important aspects of improving and evolving information technologies are: - the development of technologies in the field of analytics of large amounts of data; - integration of mobile devices and social networking technologies into the corporate environment. IDC company unites all these directions in one general term "Third platform". The development of the third platform in the near future will lead to large changes in business models in various sectors of the information technology market [5]. "The third platform" is one of the stages of the development of the information technology market in the interpretation of IDC. Analysts represent the development of the market in the form of three stages (platforms) [6].

The basis for the first platform was servers, capable of processing large amounts of data, i.e. mainframes and terminals, which have become the core and platform for thousands of applications and web services. The basis of the second platform is the traditional hardware in the form of personal computers, the development of the information telecommunications network Internet, client-server architecture for software solutions, hundreds of thousands of programs running on mainframe basis. The third platform differs from the previous ones in the development of cloud infrastructure used for solving complex analytical tasks in small and medium business, as well as in increasing demand for mobile devices, mainly smartphones and tablets that have an uninterrupted connection to the Internet. Also characteristic of the third platform is the increase in the importance and popularity of social networks in people's lives [9].
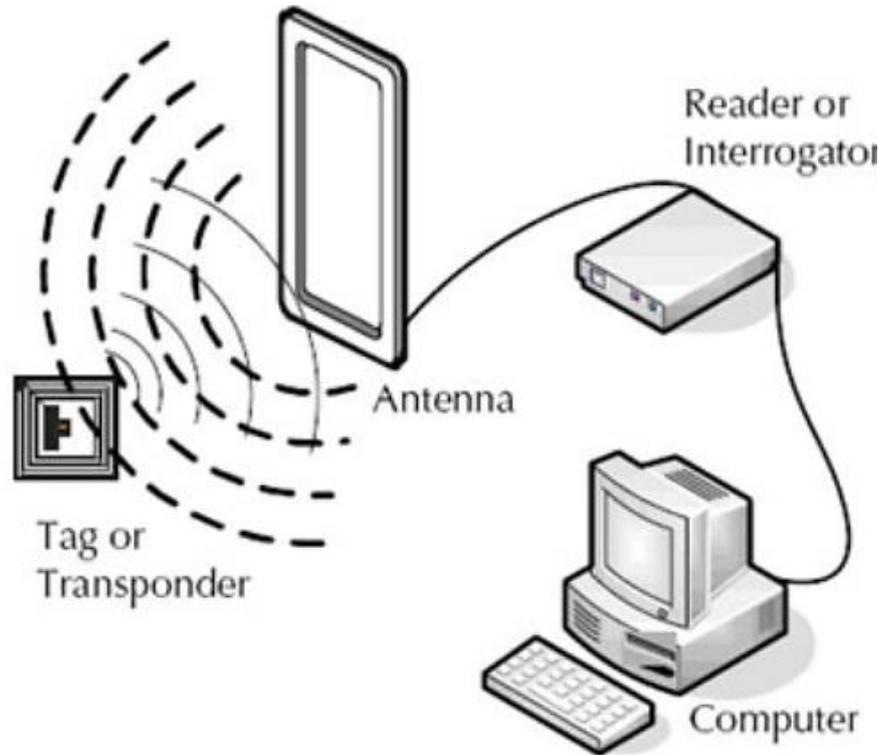
Figure 6. Platform it is servers, capable of processing large amounts of data

Table 1. Three platforms in the evolution of the IT market according to the IDC version

Stage of evolution	The basis	Number of users
1 Platform	Mainframes and terminals - the basis of thousands of applications and programs	Thousands of users
2 Platform	- traditional personal computers; - internet and web technologies; - client server software architecture; - hundreds of thousands of applications;	Millions of users
3 Platform	- large voluminous information; - mobile devices; - cloud computing; - social technologies;	Billions of users

Already, billions of users around the world have unlimited access to applications, web services, content and services that they can use anywhere and at the right time - at the heart of it all lie the technology of the third platform. All elements, which are the basis for the third platform, encourage each other to develop and expand. For example, recently the number of tablets and smartphones has grown, users of which create certain content, which, in turn, they store in the cloud and do not spend the resources of their mobile device. An increase in the growth in the number of mobile device users entails an increase in attendance and activity in social networks. The accumulated information about the actions of users in social networks can serve as a huge base for analyzing and studying theoretically valuable information, which can subsequently improve the quality of various web services, including social networks.

Also, a common example of using third-platform technologies is the use of a client application from a custom smartphone to gain access to the corporate data store of the organization in which it operates or information located on its electronic box or in social networks. In this case, the user can use the application, which is in a certain cloud, and access data located on the server of another cloud [10].

Currently, there is a large number of cloud services, but special attention deserves a cloud platform from Microsoft. Microsoft Azure is a platform based on cloud computing. The system from the global IT giant provides the ability to create, debug and execute various types of applications, as well as storing any amount of data on servers located in data centers. The platform itself is an operating system deployed on Microsoft servers, accessed through the Internet. All Azure users have access to a wide range of features and built-in services, while the platform provides a high level of availability and security.

The list of services available to users on the Azure platform includes: storage services, computing services, security services, communication packages and application solutions. Now the platform Microsoft Azure, along with services from Amazon and Google, is the leader in this area. Experts from Compuware recognized Azure as the fastest cloud platform in the world, and Nasuni recognized the platform as the leader in performance tests and the minimum number of errors in operation. It should also be noted that Azure technology was used during the Olympic Games in Sochi-2014. Every day more than 5 million unique users visited the official site of Sochi-2014. Users from around the world downloaded from the site more than 6 million copies of the official application of the Olympic Games. With the help of Microsoft Azure, as well as the system of mutual communications and Microsoft Dynamics solutions, the uninterrupted work of the official site of the Olympic Games in Sochi was achieved. [8, 12]

In addition, the technologies of the third platform are actively introduced into all spheres of people's social life. Cloud technologies are firmly rooted in the lives of not only ordinary Internet users. So, cloud computing is used very widely and quite often in the field of education. There are many examples of using cloud technologies in education: maintaining electronic diaries in schools, as well as electronic journals, creating personal classrooms for students and teachers, cloud telephony, special forums for exchanging learning information, creating interactive reception rooms and many other possibilities.

To access cloud technologies in education, you can use various programs on PCs, electronic textbooks, electronic libraries, training simulators, training systems, test knowledge systems in the form of tests, application software, teleconferences, the list can be continued indefinitely, because the tools for using cloud technology in education is very much. To apply in the educational process on the Internet, you can find a lot of cloud services.

One of the most common services are Google's cloud technologies. Consider the use in the educational process of technology Google Drive or Google drive. This is a file hosting, which includes such functions as storage of files in the cloud, the ability to share and modify files.

The service includes Documents, Presentations, Tables. Users are provided with free 15 GB of free storage space. To get started, you need to install Google Drive and have access to the Internet [11, 13].

The teacher can upload or create a file in Google Docs and, in the privacy settings, open access to this file to the students. The teacher and his students can make real-time changes to the document, create tables or presentations, it saves time in class, allows you to visualize information, teaches you how to work in a group. Also, this technology is indispensable for distance learning. Of the pluses, you can also add the replacement of paper carriers by electronic means, that is, all textbooks and abstracts can be added to Google Drive and have access to the necessary information anywhere and anytime. Experts from IDC believe that cloud technologies are the foundation for the development of corporate information systems, they will be the main driver for the development of the information technology market, both in the world and in individual states [14, 15].

4. CONCLUSIONS

Also, IDC predicts the following:

1) By 2017, more than 50% of the world's IT spending on information technology will come from the technology of the third platform for the evolution of the IT market (Cloud technologies, mobile technologies, social networks, large data computation programs). By 2020, the costs of developing third-platform technologies will increase by about 60% [16-19].

2) By 2018, world IT companies will spend half of their expenses only on the development of cloud technologies. By 2020, the cost of cloud technology will account for 60% of the entire IT infrastructure, including software, IT services and equipment.

3) By 2018, it is expected to use about 22 billion different electronic devices and computers that will transfer data via the Internet, using the technologies of the third platform, which will create more than 200,000 programs, applications and services located on the Internet.

4) In the near future more than 50% of companies will master the cloud computing industry.

5) Closer by 2018, companies that are committed to "digital transformation" will increase their software development potential by more than twofold. Two-thirds of the total number of developers will focus on creating strategic applications and services for digital data transformation.

6) Companies that are committed to digital transformation will increase their external data sources at least 3 to 5 times and will provide the world IT market with accessible data more than 100 times.

7) Increase in the growth of the number of cloud users of different types (private, public, hybrid, community networks).

8) The growth of the coverage area of global computer networks, the increase in the speed of information transfer, the use in industry and everyday life of specialized devices receiving information from computer networks.

9) By 2020, more than 30% of IT service providers will no longer exist in their present form. There will likely be a change in the leading positions.

The future is behind cloud computing, and it's not just empty words. Cloud technology is a service that can store and process huge amounts of information without using local resources [19]. Clouds are an opportunity to purchase software and computing capacity for business, without the cost of installation. With this technology, users have access to their resources from any device and at any time. In addition, cloud technologies provide new jobs for IT professionals of different profiles who are able to regulate and accompany clouds. Now, this technology continues to develop at a tremendous speed and is steadily gaining popularity among users around the world. Whether the forecasts of analysts regarding the key role of cloud technologies in the future of the world IT market will be confirmed or not, time will tell. But already today cloud computing is not just an interesting service, but firmly entrenched, useful, bringing benefit to both business and ordinary user technology that can bring big changes in the future of the person [20].

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