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MODERN ASPECTS AND PROSPECTS OF THE DEVELOPMENT OF CLOUD TECHNOLOGIES IN UKRAINE

Cloud computing is progressive and promising solution of modern processes of remote customer service information systems. Their rapid expansion is now one of the key trends in coming years and significantly affects the global development of IT-technologies. According to studies, the main motive for the refusal of customers from cloud services in the CIS is that there is insufficient data security. This motive is much less common in developed markets (USA). In the article the current state and prospects of cloud technologies in Ukraine are considered. The features and dynamics of cloud market are investigated. Particular attention is paid to costs and benefits of using cloud computing at the present stage of the development. The article analyzes the characteristics and dynamics of cloud computing in Ukraine; reveals common problems; identifies shortcomings and advantages of cloud technologies at the present stage and prospects of further development of cloud market of Ukraine. The use of the method of homomorphic encription to achieve an acceptable level of safety of modern cloud market of Ukraine is revealed.

Keywords : *information systems, cloud computing, data transmission, reliability, safety, method of homomorphic encryption.*

Introduction. Cloud technology (cloud computing) is a progressive and promising solution of modern processes of remote customer service information systems. Their rapid expansion is now one of the key trends in coming years and significantly affects the global development of IT-technologies.

The use of cloud technology is associated with great cost reduction and intensification of significant consumer risk (first of all, risks of storage, transmission and data security). In Ukraine there are still no uniform standards that would establish appropriate requirements for the quality and reliability of cloud technologies and services.

Cloudy Ukrainian market, in contrast to the developed world, is in the initial phase of the development, that is at the stage of initial accumulation of demand and consumption experience of cloud solutions. According to expert forecasts of unanimous cloud market in the coming years Ukraine will demonstrate exponential growth [1].

One of the modern trends of efficient use of information systems is the transition to cloud computing. The term «Cloud computing» as a result of direct transfer received treatment – «Cloud computing». It should be noted that the literal translation of the expression Cloud computing, like «Cloud computing», does not fully reflect the essence of the current processes of remote customer service information systems. Cloud computing, in addition to remote execution of applications, provides the full range of information services, including the storage, retrieval and transfer of information, its security and more. Therefore it's appropriate to use the term «Cloud Technology».

«The federal strategy on cloud technologies» («Federal Cloud Computing Strategy») was launched in the US in February 2011 and is continuing the work on its implementation [2]. In September 2012, the European Commission issued a strategy «Releasing the potential of cloud computing in Europe» («Unleashing the potential of cloud

computing in Europe»), aimed at accelerating implementation and significant expansion of the use of clouds in the EU economy. The authors offer strategies rather «busy schedule» of its implementation: a number of priorities is expected to perform in the near future [3].

According to statistics collected by consumer cloud market, Ukraine, like neighboring countries (Russian Federation, Hungary, most of the CIS countries) is at the stage of initial accumulation of demand and consumption experience of cloud solutions. This is also the minimum level of end-user knowledge about cloud computing and low penetration of technology. Thus, 47% of IT services consider their awareness of cloud solutions superficial, and 88% of managers are not familiar with cloud services [4].

Plans to use cloud solutions at Ukrainian enterprises and intensive development of IT technology companies create potential market, which is «to 2015 – 2016 biennium. Demonstrate exponential growth characteristic of cloud markets of developed countries» [4]. It is significant that almost the same assessments and conclusions on Ukraine came as experts of Parallels, examining the end of 2012 the dynamics of cloud markets in the CIS [4].

Prospects for rapid development of cloud services in Ukraine encouraged to consider more closely the experience of their use in more «mature» markets and to identify the main benefits and risks of these technologies to local conditions.

The purpose of this paper is: to analyze the characteristics and dynamics of cloud technologies in Ukraine; to identify common problems; to determine costs and benefits of using cloud technology at the present stage and prospects of further development of cloud market of Ukraine in this direction.

Main material. Cloud technology is one of the essential factors of international development, the impact of which on the market in the coming years will increase many times. Ukraine, as a state, is quite deeply integrated into the global information and communication processes, so doesn't be left out of this influence. Only now the country has emerging demand and consumption of initial accumulation of experience of cloud solutions in different areas of the society: economics, business, science, education and more.

The use of cloud technology in teaching is the next evolutionary step in providing educational process properties – adaptability, flexibility, openness and mobility.

Various educational institutions, implementing educational process in distance form of education, will soon have to solve the difficult problem of the feasibility of switching to the use of cloud technology. The implementation of these plans should solve a number of problems, but the most attention, in our opinion, should be paid to the following: the transition to cloud computing is necessary to select a specific way to implement cloud technology.

It should be highlighted that custom clouds can be divided into private clouds, public clouds and community clouds. In developed and developing private clouds large companies or industrial associations composed of geographically distributed branches, subsidiaries, and so on are most concerned. In this case, the main drawback of cloud technologies is eliminated – the need to transfer confidential information to third parties.

At the other extreme are the clouds that provide services to customers, regardless of their affiliation. This approach to the use of cloud technologies mostly suits to users whose requirement for privacy is not critical.

There is also a compromise creating cloud company that guarantees a fairly high level of confidentiality through the implementation of the overall information security policy partnerships and acceptable cost of maintaining such a system.

According to studies, the main motive for the refusal of customers from cloud services in the CIS is that there is insufficient data security. This motive is much less common in developed markets (e.g. USA) [5].

Conclusion. It identifies a number of mandatory conditions necessary to achieve an acceptable level of safety of modern cloud service for the user. This is possible subject to the availability of the required components:

– hardware component;

– administrative and regulatory component;

– software component.

In software components important points should be considered:

a) a full-scale anti-virus protection, especially in the case of the use of services such as SaaS (Software as a Service) and PaaS (platform as a service);

b) an availability of established special firewalls for virtual machines as well as for all operating systems that are involved in infrastructure;

c) protection systems and programs of at least the most common vulnerabilities;

d) at least mandatory encryption of (at least) important and confidential information located in the cloud.

In a way the problem of protecting systems and applications can be solved by implementing the method of homomorphic encryption. This type of encryption allows arbitrary computation of encrypted data without its decrypting. For example, Google can search for not understanding what the request, it is possible to filter spam without reading lists, to count the votes without opening the envelopes with the votes, to not read DNA tests and more.

It is understood that the man / machine / server that calculates, conducts mechanical operations with ciphers, performing for its algorithm (search in the database analysis on spam, etc.), without having any idea about encrypted in the middle information. Only the users that have encrypted their data can decipher the results of calculations.

A factor that hinders the implementation of cloud technology can be called a negative effect on the value of cloud technologies. However, its impact will lose its significance to the development of telecommunication technologies.

Considering all the above, there are **the following conclusions:**

– modern technology cloud (cloud computing) is a progressive and promising area of IT industry;

– there is projected growth in demand for high-tech «hybrid» model using cloud technology (IAAS);

– the use of cloud technologies is associated with significant risk of storage and data transfer;

– negative effect on the value of cloud technology provides the need for high-performance channels;

– the influence of high cost of communication channels will lose its importance with the development of telecommunication technologies.

Prospects for future development of cloud technologies in Ukraine will perceive as follows:

– rapid growth of cloud market in Ukraine in the coming years;

– consistency requirements to the quality and reliability of cloud technologies and services with ISO standards and the EU;

– implementing commercial data center (colocation);

– growing demand for high-tech «hybrid» model using cloud technology (IAAS);

– the growth in demand for consumer cloud technologies in various areas of society: economics, business, science, education, etc.

– the need for mixed technologies: traditional and cloud;

– the problem of systems and applications protection can be solved to some extent by implementing homomorphic encryption method.

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A factor that hinders the implementation of cloud technology can be called a negative effect on the value of cloud technologies. However, its impact will lose its significance to the development of telecommunication technologies.

Considering all the above, there are the following conclusions: modern technology cloud (cloud computing) is a progressive and promising area of IT industry; there is projected growth in demand for high-tech «hybrid» model using cloud technology (IAAS); the use of cloud technologies is associated with significant risk of storage and data transfer; negative effect on the value of cloud technology provides the need for high-performance channels; the influence of high cost of communication channels will lose its importance with the development of telecommunication technologies.

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