

## Cloud Technologies in the Promotion Strategy of Integrated Communications

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### Abstract

The article analyses prospects for business development under the conditions of a digital revolution-introduction of cloud computing. The article examines economic indicators of the development dynamics of modern communications system and analyses sociological data on cost behaviour of business information services. Data on the development strategy of cloud technologies in the system of integrated communications is outlined.

**Keywords:** cloud technology, integrated communications, IT-business, digital services

### 1. Introduction

The scaling process of a business IT infrastructure, located on an enterprise site may be slow, and organizations often fail to achieve the optimal level of IT infrastructure use.

Cloud technologies are a paradigm shift, which provides support for calculations with the use of the Internet. Cloud computing service consists of highly optimized and virtualized data processing centres that ensure provision of a variety of software, hardware and information resources, when their use is necessary (Handler, Barbier, & Schottmiller, 2012).

Businesses can connect to the cloud computing in order to use available resources and in fact pay only for the amount of used services. This helps companies avoid capital costs for installation of additional infrastructure at their sites as well as instantly increase or decrease the amount of computing resources used according to their business needs (Research in action White Paper: the hidden costs of managing applications in the cloud, 2013). Hybrid Cloud is a combination of private and public models of integrated communications. In a hybrid cloud environment individual resources are made or used in the public cloud environment, while others are made or used at the customer site, in a private cloud environment. This enhances efficiency of business.

The oil and travel industries are quite volatile sectors of the economy and often face global challenges, which business interprets in the following way: "The whole idea is a game with very high stakes", "a distinctive feature of our business is the technologies that we use", "we need a way to move in this direction and rapidly develop such a system".

### 2. Methodology

The overall picture of the cloud technology use can only develop under integral understanding of the general properties, which are the subject of generalization and synthesis of basic scientific concepts. In this paper, we used the method of empirical analysis, the main point of which is to study the obtained results and statistics. The empirical analysis is used at the stage of superficial acquaintance with the object of study and gives an opportunity to learn about the phenomenon, however, it is insufficient to gain insight into the essence of phenomena. At the same time, without understanding what cloud computing really has something to offer in the future, it would be premature to move to a large-scale study of the phenomenon. Currently, scientists are conducting a synthesis of the results and efficiency of the cloud technology use. Development of cloud technologies is associated with such concept as property. Thus, it is necessary to determine the effectiveness of

using cloud computing by various owners. The segment of cloud computing offered to business is not as extensive and as of today we need to understand who will control such technologies. The answer to these questions will allow businesses to build their information strategy to promote their goods to the market. Margaret Rose (2014), Mohamed Handakva (2012) and Michelle Maltais (2012) examined this topic in their works.

### **3. Results of the Research**

#### *3.1 Reasons for the Cloud Technologies Development*

Cloud technologies win one over with their simplicity, convenience, flexibility, and functionality. They can greatly simplify the task of a traditional IT service to update and maintain the unity of business communications and specialized software based on them. Small businesses have limited resources and capabilities to invest in their own IT infrastructure, cloud computing may be the most effective tool, as it requires minimal time to expand and scale, which is so important for the media and convergent journalism, as a sphere of media business.

However, except for quite functional convenience and risks, the important factor in choosing "cloud" computing is the desire of media business to save on IT services. Mass media that use "cloud" technologies reduce the costs of establishing and supporting their own IT infrastructure, as the main benefit of its use is the fact that you pay only for access to necessary computing power and business applications. At the same time, the economic efficiency of using "cloud" computing depends on the maturity level of the media business' IT infrastructure. Mass media who decide to transfer the standard IT infrastructure to "cloud" computing must understand that the transition process is quite expensive and they will be able to experience financial benefits only in a few years. But if an IT infrastructure is organized from the ground up, it is possible to significantly increase economic efficiency of the company.

In each of these cases, the key to success of integrated communications for mass media and convergent journalism was the use of cloud computing, namely, public cloud, a new paradigm of applications development and processing of large amounts of data.

1) Consider data on the impact of cloud services on the IT-budget of the firm based on the results of a sociological survey (The hidden truth about cloud spending) published in 2011, 55% of respondents indicated that the costs increased for: virtualization of data, 51% for ensuring IT-security, 50% - compliance with standards and management, network equipment, 44% for server utilization, 43% of respondents indicated that costs increased for network software, data storage, software server maintenance (Technology Hardware, 2014).

Thirty two percent of respondents indicated that the costs decreased due to introduction of cloud services into server services, 20% noted cost savings through the use of server software, 19% through the use of commercial software, and 18% of respondents indicated that the costs decreased due to introduction of programs aimed at improving PC performance. A global survey of IT-directors of financial companies conducted by Aite Group in October 2013 showed that 50% of them were going to use private clouds in the next two years. 41% of financial companies are using clouds for software testing, 28% place a variety of business applications there, 24% contain data processing centres in the cloud, and 21% permanently store data there. The total amount of the public cloud market in Russia in 2012 amounted to 15.6 billion roubles or 466 million dollars. The United States (Analytical Report "Collaborating in the cloud". (Forbes Insights, (Cisco), 2013). Here we include web hosting, cloud communications and collaboration, and business applications. We would like to highlight separately that the future is in "elastic" services when the user does not pay for a fixed rate plan with a fixed configuration of virtual capacity and software, but for the actual amount of cloud services used, as it is implemented, for example, by Info box. Infrastructure as a service proved to be the most popular service on a global scale and amounted to 41% and on average the more developed the cloud market is in the region, the higher the proportion of the infrastructure as a service in total scope of the Internet market. And on the contrary, the share of cloud communications and business applications at emerging markets is lower - about 35%. In Russia 88% of micro businesses, 65% of small and 47% of medium-sized companies do not have servers at all - neither internal nor cloud ones - but in the United States it is 43%, 4% and 2% respectively. The difference is huge. Moreover, in Russia 5%, 15% and 22% of those, who have some servers, use cloud resources, and in the United States the ratio is 20%, 32% and 43% respectively, a significant difference in these cross-cultural comparisons determines strategic prospects for the introduction of cloud technologies into various types of business.

#### *3.2 Integration of Communications to the Cloud*

There are several major strategic guidelines for the transfer of a company's activity to the cloud environment.

The first reason is scaling, when a business is free to scale used resources.

The second reason is elasticity, an organization is able to use a wide range of tools to perform data analysis,

graphics processing, video streaming and perform any other task.

And the third - access to databases and calculations in real time for mass media and convergent journalism. On the PC everything happens in real time, allowing you to make quick decisions.

The last reason is of fundamental character, the matter concerns a transition from acquisition of IT equipment for projects for later use on their sites to the model in which you purchase a service as you use it. The user has access as needed, and it provides greater flexibility in terms of profit and loss - this is a model of operation of many companies around the world.

Consider the practice of integrated communications for using digital services in the modern world. In 2010, business mainly used the non-cloud technology in the amount of 22 zettabytes.

2) According to experts (Smith & Mitchell, 2014; Ellison, 2014; 13<sup>th</sup> International Conference on Grid Computing, 2012) the global IT industry awaits a real boom in the cloud computing. According to the research (Cisco Global Cloud Index Report) (Analytical Report "Collaborating in the cloud." (Forbes Insights, (Cisco), 2013), by 2018 volume of traffic in global IP networks and Internet traffic will reach 1.6 zettabytes, and data processing centres traffic will grow from 3.1 to 8.6 zettabytes per year. For more efficient use of the cloud under conditions of communications integration experts give the following recommendations:

- Optimize the storage environment, which means categorization of data and selection of the appropriate storage level for it, including flash drives.
- Use a converged infrastructure, characterized by highly efficient use of resources, equipment density, energy efficiency and cost effectiveness.
- Use software-defined solutions (Software-defined, SDx), including storage systems, networking and security.
- Work of end-users also needs to be optimized, and in this case automation, adaptive technologies come to the rescue.
- Client systems also need upgrading.
- Formation of the monitoring system. Thanks to the use of a monitoring and management powerful platform, issues in the cloud can be identified before they become serious.
- The larger the scale of the cloud, the stronger the information security should be. Pay attention to the new generation of safety technologies, which cover physical, logical levels and the cloud.
- Increased use of virtualization as a base of the cloud environment. For this purpose it is important to choose a virtualization platform.

Considering modern business costs for IT-security, it should be noted that from 2008 to 2012, costs increased by 74%, according to the company (SG Cross Assert Research) main items of costs for security are the following: providing protection at the user level (5.4 billion US dollars in 2012), corporate security (4.4 billion US dollars in 2012), backup and data recovery (4.4 billion US dollars in 2012).

However, these revolutionary possibilities are accompanied by a whole new set of problems that devalued many of the traditional methods of information security in terms of integration of the business environment communications. Most providers of "cloud" technologies limit indemnification of damages in case of a security breach with the cost of their services - even if the breach occurred through their fault. Organizations, working in the field of high technologies, telecommunications, entertainment and media, faced with a number of new and ever more significant security threats, including targeted persistent attacks, destructive hacking with a combination of social and political activity. Media organizations should seek ways to maintain and strengthen security in the era of globalization of the Internet, when both third parties and digital supply chains are becoming an integral part of their business models in terms of integration of business environment communications. Information security problems and cyber risks of the modern society have become the priority media management issues of many companies. The same problem exists at the political level (Litvinenko, 2012, pp. 403-408; Potolokova & Kuryshcheva, 2013, pp. 266-269; Nikonov, 2013, pp. 241-246).

The changing nature and types of cyber risks make them extremely relevant to heads of companies operating in the high-tech, telecommunications, entertainment and media sphere. Significance of the threat of public/industrial espionage and malicious software, aimed at the destruction of industrial operating environments and SCADA systems, is determined by the size of the company. According to the research (Eliminating barriers, 2013), these types of attacks are seen as medium or high threat by heads of 67% large organizations working in the field of high-tech, telecommunications, entertainment and media, and only by 33% of top managers of

smaller companies (with less than 10 thousand employees). Such a perceptible difference suggests that large organizations need to ensure that their small contractors take all necessary safety precautions. The degree of criticality of the problem also varies across segments of the industry: 82% of media companies believe that these types of attacks present a low threat, while 50% of companies from the high-tech sector perceive this threat as a high or medium one (Open Systems of Publications, 2014). It is undeniable that any organization is vulnerable; it is not possible to avoid all the threats (IT Control Objectives for Sarbanes-Oxley, 2014). That's why identification of actual incidents and a response to them, along with prevention of threats, becomes more and more important. Indeed, today organizations working in the field of high-tech, telecommunications, entertainment and media sectors pay more and more attention to cyber recovery, not just security. In fact, companies operating in the sphere of high technologies, telecommunications, entertainment and media, where there is no effective system of business continuity management, are unlikely to consider themselves ready to face the threats posed by the modern aggressive business environment.

### *3.3 Business Strategies and Goals of Cloud Technologies Use*

About a third of organizations working in the field of high-tech, telecommunications, entertainment and media are already using cloud computing environments to store both critical and secondary computer programs. Among these respondents, 39% (but in the entertainment and media sector - 61%) store important data in the cloud environment. However, many respondents acknowledged that with the use of cloud services, there are no safety guarantees and security is often sacrificed for convenience.

Organizations, working in the field of high-tech, telecommunications, entertainment and media, should actively cooperate with external business partners in order to gain an understanding of their security practices and achieve greater effectiveness, as well as to ensure the ability of their online activity to recover rapidly.

The average annual growth of the global market in cloud analytics will exceed 26% in the near future. Cloud analytics - a rapidly developing field that combines cloud and Big Data technologies. Many organizations of mass media, advertising and marketing communications use analytical tools to better understand customer behaviour and explore the various market factors affecting the growth/decline of the market, increase in profits, customer loyalty and reduction of costs. Among the leading players in this market are HP, IBM, Microsoft, Oracle and SAP. Cloud analytics helps organizations make important business decisions.

The main driver for an enhanced analytical platform is the widespread prevalence of Big Data. Through a combination of automation, user involvement and information flows at market sites Big Data become available to the public and take place in a number of vital usage models, which are radically changing the market. Texts of social media resources: wide variety of data, including structured data, texts and media content at different social media websites. These data include information which any business can process to find valuable new ideas.

It is these infrastructure components of integrated communications (flexible web and server hosting, management systems of intranet and corporate portals) that became the main driver of growth in the cloud market and not the cloud business applications (accounting, sales management, etc.).

The most recent innovation in the integrated communications system is social networks. We can assert that social networks can become the biggest or one of the biggest trends in integrated communications over time as they allow people to join groups, share information and work together to solve various problems. Providing more effective opportunities for data exchange between people and their collaboration has always been the main factor in the evolution of technology worldwide, and social networks are something entirely new.

We can name the following examples of how cloud technologies are used to implement business strategies and achieve objectives (Cybersecurity Fundamentals Study Guide, 2014, p. 161):

- Creating flexible work/office spaces. Over a third of organizations representatives (39%) claim that they widely used cloud applications to increase staff flexibility. Tools provided by cloud technologies, which include voice, video, e-mail, instant messaging, data management, as well as access to the relevant key business processes, help employees to get information, share it and perform their duties at anytime and anywhere.
- Use of video communication in meetings. Forty two percent of all companies (and 89% of leaders) use voice communication, supplemented by streaming video, provided by means of the cloud. There are many benefits, for example, high efficiency of communication is achieved due to the ability to assess a range of interpersonal communication of an interlocutor.
- Creating workspaces for internal communities and working teams. Thirty nine percent of respondents say that they take significant steps to achieve the most advanced state: fully digital workspace for collaboration in the form of workspaces for internal communities and working teams. This indicator reaches 72% among the leaders,

for which going beyond the functional framework and boundaries of time zones are of high priority. Often at the heart of these initiatives there is a kind of a specially created social network, deliberately adapted to the interests of a business.

Forty nine percent of respondents said that heads of business units, that is, heads who are not involved in IT, engage more and more in selection and implementation of collaboration tools based on cloud technologies, as well as management of related processes. Moreover, this indicator rises to 75% in leader companies and 60% in groups of followers.

It should be noted that the higher the level of mastering cloud-based collaboration in a company, the wider the area of heads' influence not involved in IT directly. Number of cases, when respondents note that some head influences such decisions, increases significantly in leader companies. This is true both in terms of senior executives and in relation to managers of individual areas.

Table 1. Who influences in the business structure decision-making regarding joint work on the basis of cloud computing? (A survey made by (Forbes Insights) commissioned by (Cisco), was conducted in October 2012, and 532 senior executives of multinational companies took part in this survey)

	Total	Lagging	Leader
Centre	39%	31%	58%
Marketing	37%	28%	57%
Operations Management/Executive Director	40%	36%	54%
Production.	34%	23%	54%
Chief Financial Officer	50%	46%	53%
Customer Service	37%	31%	53%
Human Resource Management	36%	30%	50%
Design/Development	36%	26%	49%
Vice president of IT	36%	21%	49%
Chief Executive Officer	39%	41%	44%
Chief Technology Officer	36%	31%	40%
Chief Information Officer	31%	16%	39%

#### 4. Discussion

Today the topic of cloud technologies usage in Russia is quite relevant. Earlier we talked about the fact that Russian business does not use the cloud technology sufficiently. According to Glazunov S., who answers the question why cloud technologies in Russia still have not reached a world scale: incomprehension and quite a normal feeling of extreme caution towards all the innovations relating to such a serious issue, as a business enterprise "(Glazunov, 2013). The topic of cloud technologies is being studied in the Russian science. It was addressed by Tumanov Y. L. (2012), Petrov D. L. (2011, 2010, pp. 180-197), Odegov, S. V. (2013). Research results led to the following conclusions: optimization of joint work naturally leads to increased productivity. Today the cloud is by far the most effective way to use collaborative technologies. Therefore, now it is high time executives followed leading companies in implementation of solutions for collaboration based on the cloud technologies. Successful development of electronic businesses is based on such important elements as technological innovations, management flexibility (network approach), focus on electronic means of communication, outsourcing and so on.

#### 5. Conclusion

By type of property cloud structures are divided into three types: public (open), private and hybrid. Open (public) clouds are available to the public; they belong entirely to an external provider and use their resources. Most frequently the cloud implies an open cloud, when a service is provided through a web-application. Typical examples are Yandex, Mail.ru or Google email clients. Private clouds are placed in the company's internal network and controlled from within. Functions of private clouds are the same as of the open ones, but a level of security is higher, since only an internal network is used for data exchange. Hybrid cloud is a combination of a public and private cloud, used services are located in both open and closed environments.

Wholesale and retail trade sectors became the largest customer in the niche of the public cloud. The second place

is shared by the media and the telecommunications sectors, the third - by all kinds of IT services. A leader in the private cloud usage is the financial sector, trade and telecommunications took the second and third places in popularity respectively. As usual, information security when using cloud solutions and the lack of specificity in the long-term cost of ownership became the most important limiting factors for growth of the Internet economy and the media market.

The cloud provides many opportunities and benefits for solving the problem of intruders. Companies Microsoft, Google, Sales force and other providers of access services to the cloud environment can implement a variety of services and security technologies, concentrate the efforts of the best employees on the planet for this purpose. Companies like Google, Microsoft and Sales force are able to provide data protection services to their customers who use Gmail and Google Docs. Most importantly, these companies have the motivation to provide a higher level of openness when problems arise, they can discuss them with each other and customers to understand the essence of encountered problems and possible solutions.

In connection with the growing pace of work on formation of Russia's information society infrastructure, relevance of using cloud computing as an important underlying cause of this infrastructure becomes apparent. The main motivation for most mobile business people is the ability to accelerate decision making and reduce the cost of key processes.

Cloud technologies create a link between the transformation of IT and business, providing a business with a competitive advantage, which is reflected in a significant and long-term reduction of capital and operating costs, a possibility of more effective risk management and reduction of the time for introducing new products and services to the market.

It is the widest use of automated systems based on computer technology, databases and telecommunications equipment that allow us to speak about integrated communications in internal and external environments of an enterprise. Modern electronic business has a very different style of management from the one during the industrial stage of economic relations. Thus, the study on cloud technologies has pragmatic goals. The results of the study help businesses take measures to establish their own security or information systems.

## References

- Analytical report "Collaborating in the cloud."* (Forbes Insights), (Cisco). (2013). Retrieved from <http://b2blogger.com/pressroom/163641.html>
- Automatic SLA Matching and Provider Selection in Grid and Cloud Computing Markets. (2012). *Proceedings of the 13<sup>th</sup> International Conference on Grid Computing, ACM/IEEE*.
- Cloud Computing for Banks: Evolution or Revolution?* (n. d.). Retrieved November 11, 2014, from <http://aitegroup.com/report/cloud-computing-banks-evolution-or-revolution#sthash.71U4OHwk.dpuf>
- Cyber-security Fundamentals. (2014). *Study Guide*. Retrieved March 17, 2015, from <https://www.isaca.org/bookstore/Pages/default.aspx?>
- Elimination of barriers. The international study of security issues in the field of high technologies, telecommunications, entertainment and media for 2013.* (n. d.). ZAO "Deloitte & Touche CIS".
- Ellison, L. (2014). *Doesn't Get the Cloud: The Dumbest Idea of 2013*. Retrieved October 12, 2014, from <http://forbes.com>
- Glazunov, S. (2013). *Business in the clouds. In what way is the cloud technology useful for an entrepreneur*. Retrieved from <http://kontur.ru/articles/225>
- Hamdaqa, M. (2012). *Cloud Computing Uncovered: A Research Landscape*. Elsevier Press. <http://dx.doi.org/10.1016/b978-0-12-396535-6.00002-8>
- Handler, D., Barbier, J., & Schottmiller, P. (2012). *SMB Public Cloud Adoption*. \$51 Billion of Enterprise Disruption. Cisco. Internet Business Solutions Group (IBSG).
- How to improve efficiency of the cloud? (2014). *Open Systems of Publications*. Retrieved from <http://www.osp.ru/dcworld/2014/12/13044462.html>
- IT Control Objectives for Sarbanes-Oxley. (2014). *Using COBIT 5 in the Design and Implementation of Internal Controls over Financial Reporting* (3rd ed.).
- Kepes, B. (2011). *Cloudonomics: the Economics of Cloud Computing*. Diversity Limited.

- Litvinenko, A. (2012, June). Social media and perspectives of liquid democracy on the example of political communication of Pirate Party in Germany. *Proceedings of the 12<sup>th</sup> European Conference on e-Government in Barcelona* (pp. 403-408).
- Maltais, M. (2012, April 26). Who owns your stuff in the cloud? *Los Angeles Times*.
- Nikonov, S. (2013). Information society in its function as an object of directed influence of no politics. *World Applied Sciences Journal*, 27(Education, Law, Economics, Language and Communication), 241-246.
- Odegov, S. (2013). Technique to reduce information security risks of cloud services based on quantifying the levels of security and optimization of resources composition. *Scientific Library of dissertations and abstracts disser Cat*. Retrieved from <http://www.dissercat.com/search?>
- Petrov, D. (2010). Optimal algorithm for data migration in scalable cloud storages. *Management of large systems: Collection of works, Institute of control sciences RAS, Moscow*, 30, 180-197.
- Petrov, D. (2011). Algorithms for data migration in highly scalable cloud storage systems. *Scientific Library of dissertations and abstracts disser Cat*. Retrieved from <http://www.dissercat.com/content/algoritmy-migratsii-dannykh-v-vysokomasshtabiruemykh-oblachnykh-sistemakh-khraneniya#ixzz3SvvznqUQ?>
- Potolokova, M., & Kuryшева, Yu. (2013). Internet-Technology and Marketing: Theoretical Approach. *World Applied Sciences Journal*, 27(Education, Law, Economics, Language and Communication), 266-269.
- Research in action White Paper: the hidden costs of managing applications in the cloud. (2013). *Research in Action GmbH*.
- Rouse, M. (2014). What is public cloud? *Definition from Whatis.com*. Retrieved October 12, 2014 from <http://Whatis.com>
- Smith, M. (2014). *Hype Cycle for Cloud Computing*. Gartner.
- Technology Hardware. (2014). *This special SG Global Report*. SG Cross Assert Research.
- Tumanov, Y. (2012). Protection of cloud computing environments by software verification for presence of destructive properties. *Scientific Library of dissertations and abstracts disser Cat*. Retrieved from <http://www.dissercat.com/content/zashchita-sred-oblachnykh-vychislenii-putem-verifikatsii-programmnogo-obespecheniya-na-nalic#ixzz3SvuTdBgw>

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