

# Cloud Technology Services in the Information Security

Lubov Borisovna Sitdikova, Svetlana Jurieva Starodumova

**Abstract:** *The article is about a promising area of the information technologies development – cloud computing as one of the components ensuring information security of various countries. The article is focused on the fact that in Russia information technologies are being introduced into key areas of social life at all federal levels of state government, into the system of local self-government, into the sphere of general education, into the system of judicial authority, as well as the system of public finance (budget) management and others. The research substantiates the legal nature of cloud computing and their recognition as a paid service agreement. Highlighted are the key criteria for ensuring the quality of cloud services that require regulatory consolidation. The absence of a regulatory framework has been identified, which creates problems in the legal regulation of the provision of cloud services, which negatively affects information security.*

**Index Terms:** *cloud-based technologies, cloud computing, cloud services, cloud service quality, service.*

## I. INTRODUCTION

Every year, in the Russian Federation, more and more public relations are actualized through information and telecommunication networks, the digital economy is actively developing, new objects in the field of intellectual property are being formed, and therefore the problem of legal regulation of "digital relations" in general and cloud-based technologies in particular is quite acute. In order to ensure the information security of Russia in the political and economic spheres that actively use modern digital technologies, a strategy has been devised for the development of the information society in Russia for the period of 2017–2030 [1], as well as the landmark Program "Digital Economy of the Russian Federation" [2].

The Digital Economy of the Russian Federation Program reflects a significant increase in the use of digital technologies in everyday life, industrial relations, various structures of the economy and education, state and municipal authorities, as well as a steady expansion of cloud services. At the same time, Russia is significantly behind the European Union and other countries in the field of digital technologies introduction.

Issues of information providing through and its confidentiality on the Internet when receiving services of cloud-based technologies were raised in the research of Bernal [3], Zharova [4], Zharova [5], Suleimanov [6].

Erl and Puttini [7], [8], Kuchina [9], Saveliev [10],

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Lubov Borisovna Sitdikova, Russian State Social University (RSSU), Moscow, Russian Federation.

Svetlana Jurieva Starodumova, Russian State Social University (RSSU), Moscow, Russian Federation.

Sitdikova [11], Vasiliev [12] were engaged in analysis of various aspects of cloud services.

The security issues of cloud-based technologies use in business and the need to protect confidentiality were raised in the research of Gozman, Willcocks [13], Li, Liu [14], Subramanian, Jeyaraj [15].

## II. METHOD

and special legal methods of cognition: historical-legal, formal-legal, comparative-legal, and others. The main method used was the systemic-structural one, which allowed revealing the legal nature of cloud services.

The combination of historical-legal and comparative-legal methods made it possible to identify the peculiarities of the historical conditions effect on the development of the digital economy, as well as the influence of the Anglo-Saxon law on legislative regulation in the field of information technologies in Russia.

The formal-legal method allowed to analyze the legal norms governing the legal nature of cloud-based technologies, identify cloud computing as one of the key components of information security, and justify proposals for legislation improvement aimed at the sustainable development of entrepreneurship in Russia.

## III. RESULTS

We have found that "cloud computing" should be enshrined in the legislation (Civil Code of the Russian Federation) as a type of contract for the provision of paid services involving actions or activities of the contractor resulting in provision of access to cloud services, data storage services, access to licensing agreements for the use of software products, etc.

Three main criteria for ensuring the quality of services provided by cloud-based technologies have been suggested:

- qualification of specialists working with "cloud" equipment;
- availability of the main and additional (backup) infrastructure for the functioning of cloud services;
- mandatory destruction or anonymity of personal data of cloud services users in order to achieve the objectives of cloud services provision.

## IV. DISCUSSION

Making profit from technological development, the need to respect the rights, interests and economic security of a particular country necessitated the full-fledged



normative, and mostly legislative, regulation of information technologies in Russia [9]. Each state needs to understand what the development of information technology means for it.

First of all, it is necessary to dwell on the concept of “cloud computing”, which is cited in the Decree of the President of the Russian Federation dated May 9, 2017 No. 203 “On the Strategy for the Development of Information Society in the Russian Federation for 2017–2030”, in the “General Provisions” section: “cloud computing is a model for enabling ubiquitous, convenient, on-demand network access to a shared pool of configurable computing resources (“cloud”), data storage devices, applications and services that can be rapidly provisioned and released with minimal management effort or service provider interaction.”

This definition fully reflects the definition of the information technology model presented by the US National Institute of Standards and Technology (NIST). Thus, Russia has not formed its own national approaches to and specific peculiarities of this definition but used the international experience.

From the analysis of the definition, we can conclude that “cloud computing” is one of the new forms – the information and technology model of services rendering. At the same time, this model assumes the provision of ubiquitous access both to a set of configurable computing resources and to storage devices, as well as applications and services. Therefore, as A.K. Zharova rightly notes, “... from the point of view of legal regulation, the main thing is what is offered for access — software or hardware, or both; methods of cloud computing technology provision for use” [5].

The Russian term “cloud service” is a translation of the English term “cloud service” derived in turn from the term “cloud computing”. The word “cloud”, which is often used as an substitute for the terms “cloud computing” or “cloud-based technologies,” was originally a metaphor. A drawing of a cloud on various charts and computer diagrams initially symbolized the Internet, illustrating the fact that all the complex infrastructure and technical details of its operation are hidden from the end user, who is interested not in the process but in the result [7].

The authors describe the following most common cloud services:

1. Providing the customer with software as a service (Software-as-a-Service Concept).
2. Providing the customer with a service of a resource-platform with the created infrastructure for its further adaptation and improvement by the customer (Platform-as-a-Service Concept).
3. Providing the customer with a service of resources in the form of computing power, information storage capabilities for building their own network “cloud” infrastructure similar to the physical (hardware) structure (Infrastructure-as-a-Service Concept) [12], [10].

Legal experts have identified a number of problems when considering the issues of legal regulation of cloud computing.

First, ensuring the information security of the circulation of information containing personal data of citizens and data of limited access. This concern is caused by the fact that the majority of the cloud services used and disseminated in Russia are created outside the country [9]. Most of the largest

companies providing cloud services are located in the United States and the European Union; therefore, it is necessary to take into account the interests of the customer when creating legal regulation of information technologies in Russia, as one of the methods of information security ensuring [8].

The second problem is related to the legal mechanisms for formalization of relations in the e-economy. In the emerging law enforcement practice of Russia, relations involving the use of “cloud computing” are often formalized through service provision agreements. In particular, “Rostelecom”, as the National Cloud Platform operator, suggests formalizing all the relationships related to “cloud computing” through contracts for the provision of paid services. For example, the “Virtual Data Center” service involves leasing the computing power of the National Cloud Platform; access to Microsoft software is also offered through the provision of services (software services) [16]. Similarly, the Karavan Company suggests formalizing cloud services rendering through the same type of contracts [17]. Analysis of various websites of companies offering cloud computing shows that, as a rule, cloud computing services are delivered through the service agreements.

At the same time, according to A.K. Zharova, the theory of civil law expresses erroneous proposals to apply lease agreement to the relations of cloud computing when using a computer program. The author proposes to formalize relations on the use of cloud computing with a set of agreements: a lease agreement and a license agreement [4].

Vasiliev A.O. proposes to differentiate relations involving the use of a computer program for the purpose of “recording a work in computer memory” under a license agreement, as well as relations involving the use of a computer program functionality subject to its temporary and random recording as part of services rendering in electronic form [12].

Saveliev A.I. identifies five main ways for legal qualification of cloud services rendered by the providers: lease agreement, license agreement, paid services agreement, mixed agreement, unnamed agreement [10].

We believe that the “cloud services” rendered by Russian companies based on the service agreements are the most successful approach. To justify our position, the Presidential Decree dated May 09, 2017 No. 203 formulates the concept of “cloud computing” and interprets them as provision of universal and convenient access to the “cloud”. Hence, services are dominant in the legal mechanism for formalization of relations on the use of cloud computing, and only through the provision of service of access to cloud services the data storage capacities are leased, licensing agreements are made for the use of software products, etc. The proposed approach will fully comply with the provisions of Art. 421 of the Civil Code of the Russian Federation “Freedom of Contract.”

Thirdly, there is the problem of ensuring acceptable quality of cloud technologies services [6], which so far have been little studied both by specialists in the field of information technologies and by lawyers specializing in this field. Often, “cloud computing” in various spheres of public life are qualified as a criterion of



quality of service when providing various types of services (medical, government, banking, etc.) determining the increase in the level of informatization in the field of their provision [5].

At the same time, when regulating cloud technologies service through a contract for the provision of paid services, it is possible to apply subsidiarily the norms on a contract agreement (art. 724, 725, 783 of the Civil Code of the Russian Federation) containing sufficiently detailed regulation of work quality issues and, in particular, allowing the parties to establish mutually the corresponding quality parameters and responsibility for their non-compliance [10].

We believe that the main criteria for the quality of the cloud services provision should be:

- the qualifications of specialists maintaining the "cloud" equipment, the regular improvement of their own qualifications accounting for the dynamically developing technologies;
- availability of infrastructure base in general and additional (backup) equipment in case of failures in the storage of information in particular;
- ensuring the confidentiality of the storage of personal information in the process of cloud services obtaining and its destruction or depersonalization after achieving the goals of information processing [3].

## V. CONCLUSION

Internet services market is a top market in the European countries by a number of indicators: the largest audience, the most active advertising segment, and the largest players. Since 2015, an unprecedented growth of the global domain space as well as the .RU domain has been observed. Consumers are actively using various cloud services but the developing relationships have not yet received proper legal regulation in Russia.

Russia is ready to adopt foreign experience when formulating its own concepts in the field of legislative regulation of information technologies. However, there is still no clear position on the legal nature of cloud services and the possibility to hold the contractors liable for improper performance of obligations, loss or transmission of confidential information of users of these services, and many other questions

Special emphasis in subsequent studies will be made on the establishment of criteria for assurance of cloud-based technologies quality in addition to those identified in this research.

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