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Considerations about Cloud Services: Learning from Italian Scenario

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Abstract: Cloud services are ubiquitous: for small to large companies the phenomenon of cloud service is nowadays a standard business practice. This paper would compile an analysis over a possible implementation of a cloud system, treating especially the legal aspect of this theme. In the Italian market has a large number of issues arise form cloud computing. First of all, this paper investigates the legal issues associated to cloud computing, specific contractual scheme that is able to define rights a duties both of user (private and/or public body) and cloud provider. On one side there is all the EU legislative production related to privacy over electronic communication and, furthermore, the Privacy Directive is under a revision process to be more adaptable to new challenges of decentralized data treatment, but concretely there are no any structured and well defined legal instruments. Objectives: we present a possible solution to address the uncertainty of this area, starting from the EU legislative production with the help of the specific Italian scenario that could offer an operative solution. Indeed the Italian legal system is particularly adaptable to changing technologies and it could use as better as possible to adapt the already existing legal tools to this new technological era. Prior work: after an introduction to the state of the art, we show the main issues and their critical points that must be solved. Approach: observation of the state of the art to propose a new approach to find the suitable disciple for cloud computing contracts. Implication: main implications are about academics and researchers.

Keywords: privacy; Cloud Computing; Public Administration; provider; contract

1. Introduction: Basic concepts of Cloud Computing

We start by providing a definition of "cloud computing": this term refers to a collection of technologies that enable the delivery of a service, offered by a provider to a user, which consist of storing and/or processing data through the use of hardware/software systems distributed and virtualized on the Internet. In the rest of the paper we adopt the definition of cloud computing provided by the National Institute of Standards and Technology (NIST), of U.S. Department of Commerce, that defines cloud computing as "a model for enabling ubiquitous, convenient, on-demand network access to a shared pool of configurable computing resources (e.g., networks, servers, storage, applications and services) that can be rapidly provisioned and released with minimal management effort or service provider interaction. This cloud model is composed of five essential characteristics, three/four deployment and three service models."

Essentially the key characteristics are the following:

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1. *On-demand self-service* - a consumer can access computing capabilities without requiring human resources working whit each single service provider.
2. *Broad network access* - capabilities are available over the network (usually Internet) and the consumer could reach their own data and information using any device.
3. *Resource pooling* - providers apply a multi-tenant model to serve a large number of consumers. Usually consumers don't know exactly the location of their data (e.g., country, town, or datacentre).
4. *Rapid elasticity* - capabilities could be elastically provisioned and released to scale rapidly adapting to the incoming demand of hardware/software resources.
5. *Measured service* - pay per use or pay as you go services. Resource usage can be monitored, controlled, and reported, providing transparency for both the provider and consumer of the used service.

The deployment models are, instead, three or four. It depends if we consider the Community cloud as a single type with its peculiarities. It easier to consider only the most important models and they are Private cloud (where cloud infrastructure is provided for exclusive use of enterprises, or natural persons, and it could be owned and managed by the same organization or by a third party, or by a combination of them), Public cloud (where the structure could be similar to the Private one, but it is provided for open use by the general public) and Hybrid cloud that is a mix of the other ones. For instance an organization that has its own (private) cloud could use a public cloud to deal with sudden work peak that cannot be managed from their own cloud resources[1].

The well-known service with models is SaaS (Software as a Service), PaaS (Platform as a Service) and IaaS (Infrastructure as a Service). The standard example of SaaS is using software that is not installed on a PC or in a data center, but resides "somewhere" and it can be accessed via Internet. The most widespread example of SaaS service is e-mail but a lot of more elaborate examples are possible (Mell & Grance 2009). This service is simpler and more understandable then others and because of its simplicity it has less problematic legal implications than the other two types addressing the regulation. PaaS and IaaS, however, are offering to the end-user services and infrastructures "computing power scalable" and, in this way, more complex (Corradini et al., 2008).

SaaS, PaaS and IaaS are often connected with each other, creating a chain of services interconnected with different characteristics and different regulations. Given the complexity of these created relationships, it is clear how important and useful is the contract to regulate, to define and to clarify respective duties, rights and obligations that are arising in a cloud environment (Valentino, 2004). With the "cloud" term we can also refer to outsourcing as in case a company own activities are outsourced to third parties. As a consequence the company will have different new repercussions about management and control of processes and its own information. The best way to achieve this aim is the use of contractual instruments. In particular we have to refer our attention to the "third party's" role because this is the real base about cloud phenomenon. Indeed, we cannot use the same definition (third party) when a part of a company has been transferred outside but, in fact, it remains under the direct control of this last one (Mantelero, 2010).

Obviously, the cloud provider has the duty and the obligation to ensure the integrity of the cloud environment made by both hardware/software and network. The legal framework that accompanies

[1] For a technical definition it could be consulted "The NIST definition of cloud computing" by Peter Mell and Timothy Grance. The last version of the paper is dated September 2011 and it's available at the following url http://csrc.nist.gov/publications/nistpubs/800-145/SP800-145.pdf.

technical provisions must be able to provide rules that allow to find the "good provider of cloud services" in order to improve the consumer and user's trust and transparency (Galgano, 2000).

So it is fundamental to choose a cloud contract that provides consumers or users (that could also be public bodies) the best solutions able to protect their own information and to offer the highest level of transparency.

The actual meaning of transparency is another key aspect of this new field. The supply of computer services, regardless of the contractual type chosen by the parties, is characterized by high levels of technical skills. For this reason is difficult for end users to understand all the potential improvements of the cloud phenomenon. The widespread diffusion of cloud services has certainly improved the average technical knowledge but not enough. Contracts with cloud providers are therefore characterized by an important informational imbalance, due to a knowledge gap of technical competences, which causes a subordinate condition (or a dependent relationship) between users, both private or public, and suppliers (Valentino, 1999).

It is very unlikely that individual users can negotiate a cloud contract, because the cloud service market (especially IaaS and PaaS) is controlled by few big companies, therefore the supplies need to a "devoir de conseil" about the most useful service for final users. Essentially the "devoir de conseil" is the duty by the most technically skilled contractual part (the cloud provider) to advise the final user about his real necessity. So transparency here means that the cloud provider has a specific civil obligation to avoid the technological knowledge gap, this is important also to elude possible suing about civil damages for precontractual liability (Valentino 2005).

2. Legal Issues in Cloud Computing: the EU's Scenario

It is not easy to find the first EU's document where the term "cloud computing" was used for the first time. However Neelie Kroes (European commissioner for Digital Agenda and Vice-President of European Commission) was been talking about cloud computing since taking her position. According to Europe 2020 strategy, and in particular to its Digital Agenda, the European Commission has established to consider IT solutions that could be relevant for the development of new services, with the aim of improving the economical situation across all the European Union.

To understand the importance of ICT development this paper focuses on three recent documents (but there are others like Opinion 05/2012 on Cloud Computing by Article 29 Data Protection Working Party). They are not listed in chronologic order, but (in our opinion) they are mentioned in order of importance: 1 - proposal from the Commission for a General Data Protection Regulation; 2 - communication from the Commission about Unleashing the Potential of Cloud Computing in Europe (the so-called "cloud computing strategy") 3 - opinion of the European Economic and Social Committee on 'Cloud computing in Europe' (own-initiative opinion). All these documents have been issued during the last few years. The first one, the proposal, is the most important because it will (very likely) be the regulation that replaces the "old" data protection directive 95/46/CE. Furthermore, the regulation is a legislative act that does not need any kind of Member State's law to be applicable, so it could play its effect immediately. The others two documents are "simple" atypical acts that have the importance to disseminate the could computing culture and they are very useful to bring to all European stakeholders the raising benefits of this phenomenon (Calamia & Vigiak, 2011).

This regulation should abrogate a good number of data protection codes adopted in various Member States, including the Italian one. The main focus of the regulation, reiterated in various parts, is that

the European legislator is trying to protect the data of European citizens involved in cloud services, preventing cloud providers to move their own server abroad European Union and if they will do so this transfer must be realized in compliance with strong normative previsions for the protection of privacy. The logical and desirable consequence is that all those companies that will offer their services to European consumers should respect European laws on data protection.

The definitive release of this regulation should contain the following key legal point:

- the obligation to "privacy impact assessment";
- the obligation for companies with more than 250 employees and for public bodies to designate a "data protection officer" (responsible for the protection of personal data), whom must be competent, independent, and may be chosen outside the institution/company (for example this person could be a lawyer);
- the right to be forgotten and erased, so any interested subject can request the removal of his personal data for legitimate reasons;
- the right to data portability from a cloud provider to another one in neutral format (e.g., database file extension .csv);
- the possibility to make joint controllers "the joint controllers shall determine their respective responsibilities for compliance with the obligations under this Regulation, in particular as regards the procedures and mechanisms for exercising the rights of the data subject, by means of an arrangement between them" (Article 24). This prevision is fundamental for any kind of cloud provider especially when the company governance is hardly articulated;
- the definition of "main establishment" (the place of establishment in the European Union where the main decisions regarding the purposes, conditions and means of the processing of personal data are taken) of data controller to avoid that a company active in more than one EU State should deal with national regulation of each Member State;
- much heavier penalties, up to 2% of the total turnover of a company, to ensure that privacy must become a sensitive issue for companies' directors;
- the introduction of the accountability principle according to which each controller, in case of data breaches, must prove that has been taken the established organizational models and the logical, physical, electronic and security measures to protect data;
- the obligation to comply, when designing new product or service, the principles of privacy by design and privacy by default.

In conclusion we can affirm that the European Union is actually very focused on this new topic, even if only on the privacy side and not about contractual regulation. Cloud computing is one of the most important key actions that could help in the recovery from the current economic situation, but all future cloud services have to keep in mind that legal provisions will be in place very soon.

3. The Italian Scenario and Its Possible Evolution

To identify contract best suitable for the cloud computing phenomenon, it is important to understand what legal framework should be applied to the cloud context. In the Italian case, the typical contractual scheme that is more suitable "seems" to be the outsourcing contract (Tosi, 2001). We have to use this world "seems" because of the complexity associated to cloud computing: it may happen that the contractual scheme is flanked by other related figures and, by its side, outsourcing is a complex contract as well. In the Italian scenario, in attempt to identify the rules applicable to outsourcing contract some people has tried to assimilate it to some typical contracts already provided by law.

There are many proposals about that, contemplating, among other things, mandate, subcontracting, sale, rental and tender contracts (Pierazzi, 2009).

The outsourcing contract is essentially characterized by an agreement where a contractual party (the outsourcee) moves to another subject (called the outsourcer) some functions necessary to an enterprise goal. The outsourcing term refers to the organizational system of a company that, to define the structural characteristics of its production process, decides to outsource (in any place), in a non-episodic way an entire function or an individual phase of its activity. With the outsourcing process the company tends to concentrate its resources on its core business, in which it is able to achieve a position of leadership. In this way the company could outsource all activities for which the organization does not have specific strategies, competences, needs and special abilities. The benefits that the company aims to achieve through the outsourcing are represented by the reduction of risks for treating personal data and information, the decrease of managing direct costs, the restraint of investment costs and, last but not least, the company can easily achieve a higher managerial flexibility of its own hardware/ software information system.

In the Italian legal scenario, especially according to the most important and widespread doctrine, the theory of atypical contract has been developed in order to regulate those contractual links (outsourcing and cloud computing as well). When a contract is not regulated by law there is a duty on the interpreter (judge, lawyer, etc.) of finding the most capable regulation useful to understand what the parties would had established, because the atypical contract is determined by the practice and it does not have an explicit contractual scheme required by law (Paolini, 1983). The category of atypical contracts is the ultimate expression of contract freedom where the (Italian) legal system recognizes a sort of economical free initiative in accordance with article 1322, paragraph 2, of the Civil Code (this Article addresses the worthiness of the interest) (Pierazzi, 2009). For example the so-called fraudulent contracts (contrary to the principles or interests protected by law) and illegal (lacking a legal requirement), immoral (against morality), or, finally, irrelevant contracts are not worthy of protection and they cannot be protected by the Italian Civil Code despite the contract form liberty (Perlingieri 2006).

The outsourcing contract, and therefore the cloud computing as well, is a subcategory of atypical contract and the traditional doctrine believes that in order to establish the legal rules applicable to atypical contracts, they must refer to the so-called “theory of analogy” without prejudice to the application of general discipline of contract that is independent from any kind of usual contractual scheme.

In outsourcing and cloud contracts, however, there are (usually) many contracts linked to each other (for instance hardware sell or rental, software licences, customer support, etc.) with the result of creating a figure in some ways new and certainly different from the pre-existing others: this kind of merge could learn towards the so-called “mixed contract” (Ricciardi, 2000). In the presence of a mixed contract, the legal framework that will be applied is given by the “theory of absorption”. According to this theory the discipline is determined by the contract which is more prevalent, instead of the theory of analogy: in this way it is easier to find the correct legal instruments applicable to the cloud service contracts (Cataudella, 2009).

To establish if a cloud contract should be qualified as an atypical contract (similar to outsourcing) or not, the Italian courts seem to express some doubts because of their natural tendency to schematize, using already existing contracts provided by law, in order to obtain a practical solutions to find more quickly fair regulations applicable to each single case. However, again, to qualify the cloud contract in the most appropriate way it is necessary to apply the appropriate regulation scheme. For example, if a

hypothetically disagreement concerns non-compliance with hardware, we can apply the law concerning sale or rental contracts; however if the disagreement arises on the performance of some kind of provided services (customers care), we can apply the tender contract law (Rizzo, 1981).

In this brief analysis we have shown that, due to the complexity of the cloud computing phenomenon, it is difficult to bring a cloud service contract into one typical contractual scheme powered by law, and none of the available theories seem to provide suitable solutions. Indeed there are too many elements that each time could change the basic principles. All these considerations bring us to understand that, from time to time, we could use the discipline of rental, licence, sale or tender contracts, avoiding atomizing the entire economic operation (Perlingieri 2003). The atomization of the operation is dangerous. More precisely, only if we consider the entire economical operation, built by several linked contracts, we are able to protect the weak party (identified case by case). Regarding the banking and financing law, the Italian and the European's legal acts usually provide application thresholds established in terms of quantity (an important example is provided by Article 144, Comma 4, of Italian legislative decree No. 385/1993, the so-called "Bank Law") in order to consider the entire operation and avoiding all malicious fragmented contracts oriented to elude the proper regulation (De Nova 1995).

Assuming a terminology that is certainly neither technical nor legal, we can speak of a "multiple choice" contract with a single minimal unit (loosely defined the "cause of contract") but enriched by several developments to catch and to satisfy the necessities of contractors. This contractual dynamic is justified in the new, extremely fluid and constantly evolving ICT context.

The "multiple choice" contract of cloud computing would develop on three basic aspects:

- the first concerns the general aspects: contract language, law and jurisdiction, responsibility, consideration, possible development of sub-contracts due to the complex underlying chain, etc.;
- the second concerns more specific details, such as privacy and security of cross-border data flows. Furthermore it is very important to establish a penalty clause to invert the burden of the proof during an hypothetically sue about compensation for civil damages: in this way users will be able to avoid slowness about international (even if EU) claim of civil damages;
- the third aspect should be the development of the contractual structure, such as the prediction of so-called Terms of Service (ToS) or Service Level Agreement (SLA) (Skene et al. 2010). Related to this last aspect it becomes fundamentals to provide an escape clause just in case of missed achievement of planned SLA.

Combining the Italian approach to contract interpretation with the new instruments that the European Union is offering, could be a strong starting point to build the necessary expertise to manage carefully the cloud computing revolution.

4. Conclusion: Suggestions to Manage Cloud Computing Carefully

The European Union is trying to provide the right legal tools to be used in the new phenomenon of cloud computing. There are different areas where cloud could find application, such as Internet of things that likely to expand next years: in smart homes we will surrounded by smart and active devices. We will have not only refrigerators that are able to communicate the expiring date of our food, but we will have a global connection to our home. What can happen if the electric company knows when I'm at home? What if the telecommunication provider can understand my shopping

habits on the internet? They are only two simple examples, but in the near future we will not only be connected, but we would entrust our data, our personal information, our digital identity to a few big companies, which are now moving in the direction of a proper management of privacy in cloud computing.

The two key points that need to be addressed in the cloud computing era are:

1. privacy issues;
2. legislation about cloud contracts.

The first point is probably the thorniest but, paradoxically, it is the most addressed. In fact the European Commission is producing a new European regulation (actually a proposal, as said above) with a clear focus over cloud phenomenon. For sure it is not easy to convert theory into practice but the starting point is well defined. In order to improve the above theory we can use other precious allies like ISO/IEC FDIS 27001 (there is also a recently published ISO/IEC 27013:2012 standard that merges ISO 27001 and ISO 20000-1): it is a landmark for improving information security management system. The basic idea is to understand the real ambient where we are operating, so it is central to adopt the PDCA process model (Plan-Do-Check-Act). Of course ISO 27001 does not make data 100% secure, but it is a useful guidance to approach with common sense the entire lifecycle of our data (and information) and, as a consequence, our cloud service.

Regarding the second key point above, we have to understand that it introduces a new idea of contract as a legal instrument: it is nowadays more and more oriented to the economic operation concept (Gabrielli, 2003). It is certain that IT contracts (included the cloud service one) usually express the parties' need to negotiate contracts not provided by typical legal schemes, even if worthy of protection, because of their socially relevant interests (Perchiunno, 2005). In this way, to find the most suitable regulation for cloud contracts, a possible solution could be obtained from the Italian legal concept of "linked contracts"[1]. Each single contract, in cloud entire economical operation, is subjected to the latin brocardo "simul stabunt simul cadent" where if one of the different contract is revoked, withdrawn or terminated (for any reason) the entire economical operation will fall down. So each contract remains separated, and its proper regulation as well, if connected to the final structure, but it will lose its autonomy in entire and broader economic operation (Lener, 1999).

The last step, strictly connected, is less power contracting party covered by the transparency idea: as said above in cloud contracts it could happen that the outsourcee is the real party that has to be protected because of the "information gap" of technical aspects.

In conclusion the transparency[2] ("devoir de conseil"), the use of penalty clauses, the service level agreement (SLA) with a specific prevision of an escape clause and the above-mentioned "linked contracts" discipline are the essential legal instruments to be used in addition to the privacy legal framework that EU is about to update.

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[1] The Italian legal concept of "collegamento negoziale" is difficult to translate. Like in this case, often in IT contracs there are a lot of different types of contract mixed each other in an unique economical operation. As said there could be sale, rent, mandate and/or licence agreement (EULA for instance) regulation.

[2] Bona fide general clause provided by 1337 (in the negotiation phase), 1375 (in the execution of the contract) and 1366 (in the phase of the interpretation of the contract) of Italian Civil Code.

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