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## Property and the cloud

Cesare Bartolini <sup>a,\*</sup>, Cristiana Santos <sup>b</sup>, Carsten Ullrich <sup>c</sup>

<sup>a</sup> Interdisciplinary Centre for Security, Reliability and Trust, University of Luxembourg, Luxembourg, Luxembourg

<sup>b</sup> Institute of Law and Technology, Autonomous University of Barcelona, Barcelona, Spain

<sup>c</sup> Faculté de Droit, d'Economie et de Finance, University of Luxembourg, Luxembourg, Luxembourg

### A B S T R A C T

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Data is a modern form of wealth in the digital world, and massive amounts of data circulate in cloud environments. While this enormously facilitates the sharing of information, both for personal and professional purposes, it also introduces some critical problems concerning the ownership of the information. Data is an intangible good that is stored in large data warehouses, where the hardware architectures and software programs running the cloud services coexist with the data of many users. This context calls for a twofold protection: on one side, the cloud is made up of hardware and software that constitute the business assets of the service provider (property of the cloud); on the other side, there is a definite need to ensure that users retain control over their data (property in the cloud). The law grants protection to both sides under several perspectives, but the result is a complex mix of interwoven regimes, further complicated by the intrinsically international nature of cloud computing that clashes with the typical diversity of national laws. As the business model based on cloud computing grows, public bodies, and in particular the European Union, are striving to find solutions to properly regulate the future economy, either by introducing new laws, or by finding the best ways to apply existing principles.

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## 1. Introduction

Cloud computing is a very important technological development which cloud-utilizing organizations (enterprise and government customers) and consumers are increasingly taking up on an as-needed basis. Within this property paradigm shift, enterprises outsource data processing capabilities, Internet-

based resources, and delivery of IT applications, storage, and memory space to cloud services. Clients thus benefit from larger, scalable storage, processing capacities, and ubiquitous access to their data and preferred services, while the enterprise does not need to own such resources or perform their management and maintenance.

The cloud is also making the exploitation of Big Data possible<sup>1</sup>, as it allows to move, share and reuse data seamlessly

\* Corresponding author. Interdisciplinary Centre for Security, Reliability and Trust, Université du Luxembourg, 29, Avenue J.F. Kennedy, Luxembourg, L-1855, Luxembourg.

E-mail address: [cesare.bartolini@uni.lu](mailto:cesare.bartolini@uni.lu) (C. Bartolini).

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<sup>1</sup> Alongside the data created by billions of people using digital devices and services for personal and professional reasons and data generated by the increasing number of connected objects, other sources of data are research, digitized literature and archives, and public services such as hospitals and land registries. Big Data creates new possibilities to share knowledge, to carry out research and to develop and implement public policies. It should be pointed out that “Big Data” is more of a buzzword used in industry and in research than a technical concept. There is no precise definition for Big Data, and its meaning can change according to the context. See Jacobs, “The Pathologies of Big Data.”

across global markets and borders, and among institutions and research disciplines. The ability to analyze and exploit Big Data is having an impact on the global economy and society, opening up possibilities for major scientific, industrial and social innovations. A key part of this impact is the change in the way scientific research and knowledge are carried out, as the world is moving toward the open science paradigm and science clouds<sup>2</sup>. In this line, the *European Cloud Initiative*<sup>3</sup> builds on the *Digital Single Market (DSM) Strategy*, which aims, *inter alia*, at maximizing the growth potential of the European digital economy<sup>4</sup>. The plan is to develop a trusted, open environment, called the *European Open Science Cloud*<sup>5</sup>, for the scientific community to store, share and reuse scientific data and results. The European Open Science Cloud would make science more efficient by better sharing resources at national and international levels<sup>6</sup>.

While cloud services potentially bring about many tangible and varied benefits to end-users, they also come with numerous legal risks hampering its wide adoption. In addition to the economic implications that are beyond the scope of this work, several problems concerning cloud computing arise from a legal point of view. The traditional legal framework might be seriously jeopardized by the advent of cloud computing, especially concerning the concept of property. In particular, there exist two distinct perspectives under which property can be analyzed, and mixing them up can lead to confusion. On one side, there is the perspective of property of the cloud. Structurally, a cloud is a combination of hardware and software. The former consists of a set of material goods, subject to ordinary property rules, and circulating according to real estate laws. The software, on the other hand, is subject to the vast and complex framework of intellectual property rules, and generally governed by means of contracts and licenses. However, both must be regarded as business assets of the cloud provider, as neither the hardware nor the software is sufficient to run the cloud services without the other. As such, they are also encompassed by business law. The interaction of these three sets of rules stems some questions that this paper tries to address.

The opposite perspective concerns the property in the cloud. More often than not, cloud services collect and store data belonging to their users, or of the users of enterprises relying on those services in the case of a B2B paradigm<sup>7</sup>. This data, for

example, can pertain to personal data (including pictures of the person), writings or other pieces of art (including photographs that cannot be regarded as personal data), school notes, technical documents used for work, private documents such as administrative material or accounting data, backup copies of purchased electronic materials such as books, music or movies, software under development, and so on. Clearly, cloud storage services<sup>8</sup> tend to have a larger variety of data that can be stored by end-users, but, in general, some amount of data is collected by any cloud service<sup>9</sup>. All this data raises very important questions concerning its property. Additionally, this data can be subject to protection according to its content (e.g., data protection, copyright, trade secrets, and the like), which further complicates its applicable legal regime.

Yet, no specific pan-European regulation has been elaborated so far embracing cloud computing. Although generally not strictly tailored for cloud computing, a large number of regulatory instruments apply to that domain<sup>10</sup>, mostly concerning the non-material perspective of the cloud. These regulations generally focus on the contractual issues between the cloud service provider and other stakeholders, such as end-users or the businesses that rely on the cloud.

Consequently, the European Commission described the current context of cloud computing in harsh tones. It remarked a lack of legal certainty in terms of access and usage, restrictions to the free flow of data, a proliferation of unbalanced contracts with cloud providers who “use complex contracts or service level agreements with extensive disclaimers”<sup>11</sup>, and the resulting risk of unfair contract terms being imposed on consumers. According to the Commission, this context has led to a lack of confidence in digital systems and a reluctance to use these services. Building a consumer-friendly legal and policy framework for cloud computing involves addressing a series of cross-cutting issues in multiple areas, such as data protection, copyright, consumer protection, trade secrets, licensing, security, dispute resolution and contract law, among other legal instruments, all while guaranteeing the neutrality of the Internet. The General Data Protection Regulation<sup>12</sup> and the forthcoming revision of EU copyright legislation<sup>13</sup> provide general frameworks that are relevant in this context. If an expectation of compliance is to be achieved

<sup>2</sup> Hoffa et al., “On the Use of Cloud Computing for Scientific Workflows.” For the implementation of a cloud service for open science, see Grossman et al., “The Design of a Community Science Cloud.”

<sup>3</sup> “Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions: European Cloud Initiative - Building a Competitive Data and Knowledge Economy in Europe.”

<sup>4</sup> “Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions: A Digital Single Market Strategy for Europe.”

<sup>5</sup> <http://ec.europa.eu/research/openscience/index.cfm?pg=open-science-cloud> (visited October 27, 2017).

<sup>6</sup> European Commission, *Results of the Public Consultation on the Regulatory Environment for Platforms, Online Intermediaries, Data and Cloud Computing and the Collaborative Economy*.

<sup>7</sup> See *infra* at Section 2.

<sup>8</sup> Such as Dropbox.

<sup>9</sup> At the very least, the data required to securely access one's account.

<sup>10</sup> For an approach to assess the legal compliance of a cloud service, see Di Martino, Cretella, and Esposito, “Towards a Legislation-Aware Cloud Computing Framework.”

<sup>11</sup> “Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions: European Cloud Initiative - Building a Competitive Data and Knowledge Economy in Europe.”

<sup>12</sup> Regulation (EU) 2016/679 of the European Parliament and of the Council of 27 April 2016 on the protection of natural persons with regard to the processing of personal data and on the free movement of such data, and repealing Directive 95/46/EC (General Data Protection Regulation).

<sup>13</sup> “Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions: Towards a Modern, More European Copyright Framework.”

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