

Big Data Flow from Space to the EU: Open Access and Open Dissemination Policy vs. the Common European Data Space

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1. Introduction

*“Digital Technologies and digital communications are permeating every aspect of life. We need to work for a Europe that empowers our citizens and our economy. And today both have gone digital”.*¹ This sentence clearly draws the actual world situation (the Internet of Things, IoT, is permeating our daily life) and the European Union’s *ratio* in investing in and regulating the Digital Economy (to empower European economy and European citizens). European institutions are aware of the fact that data has become an essential resource for economic growth, job creation and societal progress (Communication from the Commission “Building a European Data Economy”, COM (2017) 9 final) and that the analysis of combined data is essential for policy making and the prediction of future events, both economic and natural.²

This statement has to be completed by the assumption that our daily life is more and more dependent on space-based applications, since telecommunication tools, critical infrastructures and public or private services

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1 President Juncker statement, State of the European Union Speech, 4 September 2016.

2 In the European Digital Economy Strategy it is stressed that generating value at the different stages of the data value chain will be at the centre of the future knowledge economy. The aim of improving analytics and processing of data, especially big data, is to: i) transform Europe’s service industries by generating a wide range of innovative information products and services; ii) increase the productivity of all sectors of the economy through improved business intelligence; iii) better address many of the challenges that face our societies; iv) improve research and speed up innovation; v) achieve cost reductions through more personalised services; vi) increase efficiency in the public sector. See <https://ec.europa.eu/digital-single-market/en/big-data>

mostly rely on data generated by space systems of satellites. The *ratio* that is pushing the European Union in investing in space programmes is almost identical to the above-mentioned one: to empower the EU economy (reference is made to the abolition of the third States' hegemony and to the promotion of a sustainable development) and EU citizens (who profit of the data generated by European programmes that circulate under EU rules).³ In this context the notion of *common data space* within the EU follows the definition of the common market, thus defining the creation of a seamless digital area within the EU in order to improve the four fundamental freedoms. On 25 April 2018 the European Commission adopted the Communication "*Towards a common European data space*" which proposes a package of measures aimed at the building of principles for data sharing between businesses and between businesses and the public sector.⁴ The measures proposed bring together data, as a key source of innovation and growth, from different sectors, countries and disciplines. It expressly refers to satellites data, acquired by Copernicus Sentinel satellites, as a source of innovative services that can be offered by private and public actors who contribute to the realisation of EU aims. Precisely, the document stresses the economic impact of the data economy, pointing out their positive effect impact on productivity and competitiveness of European businesses, societal challenge and environmental protection.

3 On the European Union's intervention in space see M.E. De Maestri, *Commento all'articolo 189 TFUE*, in F. Pocar, *Commentario breve ai Trattati della Comunità e dell'Unione Europea (BreviariaJuris)*, II ed., CEDAM, Padova, 2013; L. Zagato, *La politica di ricerca delle Comunità europee*, Padova, 1993; J. Elizalde, *Legal Aspects of Community Policy on Research and Technological Development (RTD)*, in CMLR, 1992, p. 311; F. Salerno, *Le competenze delle tre Comunità europee in materia di ricerca scientifica*, in *Riv. dir. int.*, 1991, p. 850; M.E. Gonçalves, *Quelques Réflexions critique sur l'acte Unique Européen et la recherche-développement*, in *Rev. marché commun*, 1990, p. 457; S. Marchisio, *L'Europa e la politica spaziale*, in *Affari Esteri*, 2003, p. 641, A. Martin (con la partecipazione di M. Couston e L. Ravillon), *Galileo. Chronique d'une politique spatiale européenne annoncée*, Parigi, 2009; Frans G. von der Dunk, 2017. *The European Union and the Outer Space Treaty: Will the Twain Ever Meet?* In *Fifty Years of the Outer Space Treaty: Tracing the Journey* (Ajey Lele, ed.), pp. 75–90. New Delhi: Pentagon Press; Frans G. von der Dunk, *The EU Space Competence as per the Treaty of Lisbon: Sea Change or Empty Shell?* in *Proceedings of the International Institute of Space Law* (2011), p. 382-392. The Hague: Eleven International Publishing.

4 Communication from the Commission to the European parliament, the Council, the European Economic and Social Committee and the Committee of the Regions, *Towards a common European data space*, COM(2018) 232 final; Commission Staff Working Document, *Guidance on sharing private sector data in the European data economy*, SWD(2018) 125 final.

2. Space Data Policy: From the UN Space Treaties to the 1986 Principles

Space vehicles have been used for analysis of the planet since the launch of Sputnik I on 4 October 1957: States have financed Earth observation programmes in order to obtain information relevant to their public policies. Given that States, whether by themselves or through international intergovernmental organisations, were the main actors in outer space, the legal framework for the activities carried out in that domain is primarily set out in: a) international sources, such as customary international law and treaties, and b) acts (such as soft laws) adopted by organs of international intergovernmental organisations. The complex of those instruments lays down a number of general principles by virtue of which States are obliged to pursue the interest of all mankind in the conduct of their activities.

None of the rules contained in the UN space treaties⁵ (nor in customs⁶) precisely deal with space data acquisition and dissemination, however the applicability of the principles set forth in the treaties to earth oriented activities is not questionable: even if the scope of application of the OST to Earth-oriented activities has been the subject of some discussion, it is well established that the treaty applies to the space-based phase of data acquisition, while the data dissemination and accessibility phase should be excluded from its scope of application.⁷

Article I of the OST in fact refers to both the use and the exploration of outer space, and there is no doubt that the activity of capturing data of the Earth from Earth-orbiting satellites, or the activity of producing and elaborating data within the space technology, are carried out by using outer space and, prior to that, accessing it⁸.

5 Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, including the Moon and Other Celestial Bodies, London/Moscow/Washington DC, 27 January 1967, entered into force 10 October 1967, 610 UNTS 205; Agreement on the Rescue of Astronauts, the Return of Astronauts and the Return of Objects Launched into Outer Space, London/Moscow/Washington DC, 22 April 1968, entered into force 3 December 1968, 672 UNTS 119; Convention on International Liability for Damage Caused by Space Objects, London/Moscow/Washington DC, 29 March 1972, entered into force 1 September 1972, 961 UNTS 187; Convention on Registration of Objects Launched into Outer Space, New York, 14 January 1975, entered into force 15 September 1976, 1023 UNTS 15; Agreement Governing the Activities of States on the Moon and Other Celestial Bodies, New York, 18 December 1979, entered into force 11 July 1984, 1363 UNTS 3.

6 R Jakhu, *International Law Governing the Acquisition and Dissemination of Satellite Imagery*, 29 J Space L 65 66 (2003); p 76.

7 See G L Hopkins, *Legal Implications of Remote Sensing of Earth Resources by Satellite*, 78 Mil L Rev 57 at 69 (1977).

8 Furthermore, Principle III of the UNGA resolution on remote sensing, (note 6 above) clearly recalls the OST as constituting the legal framework for remote sensing activities.

In accordance with the provisions of the Treaty, one basic principle can be established:⁹ the free exploitation of space-based activities. However, this is completed by a set of mandatory ancillary principles, such as: a) access to outer space has to be granted on the basis of equality; b) entities accessing space have to act in accordance with international law and c) in the interest of maintaining international peace and security; d) States have to accord international co-operation and understanding; e) the international liability of the State that carries out a space activity has to be ensured and f) if the activity in question is carried out by a private operator, it is necessary for it to obtain an authorisation from the appropriate State to which international responsibility and liability attach. All the above-mentioned principles can be, and have to be, connected and applied to the precise activity of acquiring data throughout the space technology. This means that States (and private entities authorised by States) or international organisations are free to access and exploit outer space in order to produce or acquire data deriving from the earth surface and the objects located on it, but in accordance with the ancillary principles.

2.1. The UN Principles

The sole international legal instrument dedicated to the regulation of the acquisition of data in space relates to remote sensing and is characterised by a tortious path started in the 1970s, when the use of remote sensing data widened and its applications began departing from military purposes in order to meet other needs of the international community. In 1973, the UN COPUOS began drafting a set of principles governing remote sensing in an attempt to find a compromise between three legal approaches concerning the boundaries of this activity.¹⁰

9 See F de Graaf, G C M Reijnen, *Data Protection in the Technique of Remote Sensing by Satellites*, in *Proceedings of the Twenty-Second Colloquium on the Law of Outer Space* (Munich, Germany, 1979), p 245.

10 During the UN COPUOS deliberations, three discrete sets of proposals were presented. A Latin American draft of basic articles for a treaty concerning remote sensing of natural resources by means of space technology; UN Doc A/C.1/1047 (1975). A set of Franco-Soviet draft principles governing remote sensing of Earth resources from outer space; UN Doc A/AC.105/1.69 (1974) and UN Doc A/AC.105/C.2/L.88 (1974). A US proposal for guidelines on remote sensing of the natural environment of the Earth from outer space. UN Doc A7AC.105/C.2/L.103 (1975). For an analysis of the three drafts, see D M Poulter, *Remote Sensing and State Sovereignty*, 4 J Space L 99 (1976); D A Greenburg, *Third Party Access to Data Obtained via Remote Sensing: International Legal Theory versus Economic and Political Reality*, 15 Case W Res J Int'l L 361 (1983); J H Weaver, *Lessons in Multilateral Negotiations: Creating a Remote Sensing Regime*, 7 Temp Int'l & Comp

Consensus was finally reached in UNGA Resolution 41/65,¹¹ which contains fifteen Principles (the Principles) relating to the remote sensing activities of UN member States. The compromise is self-evident from the nature of the legal instrument adopted: the resolution is a typical soft law act, which has no binding effect upon States, which remain free to set their own national rules concerning remote sensing.¹²

Even if Resolution 41/65 fails to lay down a specific regulatory framework, it can be seen as a guide for national legislators in drafting proper mandatory rules governing remote sensing, and it demonstrates the international attitude towards the activity of obtaining data from space technology.

Resolution 41/65 reflects the basic principles of the OST, being entirely in line with its aim when stating that remote sensing shall be carried out for the benefit of all States, irrespective of differences based on their social, scientific and economic development. For this purpose, international co-operation is both favoured (and required by Principle V), in order to allow developing countries to take advantage of this technology.

One of the main guidelines that surface from the document is the open access and open dissemination policy, both to the sensed State and to other interested parties. The rule attempts to set a balance between the principle of open and free access to space activities and the principle of national sovereignty, accessing the wide approach promoted by the US in the preliminary works together with the right of the sensed State to access data relating to its territory. In any event, no provision requiring the prior consent of the sensed State to the acquisition and dissemination of data is to be found within the Resolution. The above-mentioned principle must however be read in compliance with Principles IV and XIV, following which the sensing State

J 29 (1993). For a broad analysis of the UN Principles, see F Tronchetti, *Legal Aspects of Satellite Remote Sensing*, in F von der Dunk, F Tronchetti (Eds), *Handbook of Space Law* (2015, Cheltenham: Edward Elgar Publishing), p 501.

11 A/RES/41/65, 3 December 1986, Principles relating to remote sensing of the Earth from space.

12 Despite the legal nature of this instrument itself, however, it has been argued that the Principles have reached the objective and subjective constitutive elements of customary international law, thus becoming mandatory for all States of the international community. See H Feder, *The Sky's the Limit? Evaluating International Law of Remote Sensing*, 23 Int'l L & Pol'y 599 at 600 (1991): “*insofar as such pronouncements represent the consensus of the international community with respect to an area of space law, they therefore promulgate instant customary law*”. Such a theory is based upon the fact that Resolution 41/65 mainly reflects the basic principles of international space law, without adding any special rule concerning remote sensing activity, and creates a customary international law rule wherever a field of high technological development is concerned. Even if this statement can be supported by the evolution of customary international law concerning access to and the use of outer space, the practice of national legislatures shows that there is no custom in the remote sensing area.

must take into account the rights and interests of other States and entities under their jurisdiction and shall respect international law, otherwise it will incur in international responsibility and will be called to compensate damages caused by its unlawful activity.

In recent years, the commercial possibilities of space-based activities have dramatically changed the approach to outer space technology, thus leading to a debate as to whether the current legal framework is still suitable for the regulation of current activities and applications.

Such an evolution also relates to the acquisition of data from space; while, as previously stated, at the origin of space exploitation the data acquired by the technology were prominently used by public actors in order to pursue public policy's objectives, nowadays private actors have entered the scene and impose their views. Moreover, other two evolutionary paths have to be considered: first of all the evolution of the technology goes along with the evolution of the objectives and aims of the European Union. If during the first 50 years of its work competences were mainly limited to the realisation of the internal market, in the last 15 years new interests and objectives influenced its action and the amendments to the Treaties. Secondly, while in the 1970s the use of this technology was typically devoted to scientific purposes, nowadays it is increasingly used by policymakers and private operators in many fields of human activity (including, among other things, resource management, agricultural production, hydrology, environmental protection, flood prevention, desertification, the prevention and management of natural disasters and commercial purposes).¹³

In the light of these trends, therefore, it is not surprising that the legal regime governing space law and space data policy reveals many gaps in a number of relevant aspects. Such gaps have to be filled by other international instruments (and will continue to be the subjects of future normative intervention), by national legislation and by data policies implemented by national and international operators.

2.2. The European approach to space data

2.2.1. Inspire Directive

The first step the EU moved in the regulation of space-derived information dates back to March 2007, when the EU adopted the so-called INSPIRE

¹³ See M Bourély, *Legal Problems Posed by the Commercialization of Data Collected by the European Remote Sensing Satellite ERS-1*, 16 J Space L 129 (1988); P Achilleas, 'La libéralisation des activités de télédétection', in Société Française pour le Droit International (SFDI), *Journées d'études: Le droit de l'espace et la privatisation des activités spatiales* (2003, Paris: Pedone), p 77.

Directive,¹⁴ dealing with the use of spatial data for environmental protection purposes. The aim of this directive is to harmonise existing infrastructures for spatial information established and operated by EU Member States.¹⁵

The INSPIRE framework lays down general rules for the purposes of EU environmental policies and other policies or activities that may have an impact on the environment.¹⁶ It is aimed at assisting policymaking in relation to policies and activities that may have a direct or indirect impact on the environment, as well as at the removal of the obstacles to the sharing of spatial data and services between public authorities within and among Member States and toward European institutions and bodies.¹⁷ Precisely, it provides a broad harmonisation framework to ensure operational coherence between the various national building blocks aimed at establishing a Europe-wide infrastructure.

From a general point of view, six common principles drive the INSPIRE directive and the action of member States: i) data should be collected only once and kept where it can be maintained most effectively; ii) it should be possible to combine spatial information from different sources across Europe seamlessly and share it with many users and applications; iii) it should be possible for information collected at one level/scale to be shared with all levels/scales, and be both (1) detailed, for thorough investigations, and (2) general, for strategic purposes; iv) geographic information needed for good governance at all levels should be readily and transparently available; and v) it should be easy to find what geographic information is available, how it can be used to meet a particular need, and under what conditions it can be acquired and used; vi) exceptions to the data sharing are admitted where the sharing would compromise the course of justice, public security, national defence or international relations, but member States have to provide due justification.

14 Directive 2007/2/EC of the European Parliament and the Council of 14 March 2007 establishing an Infrastructure for Spatial Information in the European Community (INSPIRE), in *OJ L* 108, 25 April 2007, pp 1–14.

15 Directive 2007/2/EC provided for a transposition deadline of 15 May 2009; however, many Member States fulfilled their duty to implement it later (mainly in 2010).

16 The juridical basis for the adoption of the directive was originally found in article 175, paragraph 1 of the Treaty Establishing the European Communities (EC Treaty, 1957 - Nice Consolidated Version, 2001) – and is now re-enacted as article 192, paragraph 1 of the Treaty on the Functioning of the European Union (TFEU). It prescribes the use of the ordinary legislative procedure to decide what action is to be taken to achieve the objectives of EU policy on the environment.

17 Following an economy principle, in deciding how the “sharing information” goal shall be reached, INSPIRE is based on existing infrastructures for spatial information that have been created by the EU Member States, made compatible with common implementing rules and supplemented by measures at EU level. The EU measures should ensure that the infrastructures for spatial information created by the Member States are compatible and usable in an EU and trans-boundary context.

2.2.2. EU Space Programmes Data Policy: the case of Copernicus

The principle of open access to space for space data having been established both at the international and at the European level, it is self-evident that the main issue arising relates to the conditions provided by each State or operator with reference to the use and dissemination of acquired data. Therefore, in order to verify the effects of the open access principles in practice, it is necessary to shift from the public law field to the private law one, having a look to contractual licence conditions that characterise the relationship between the data provider and the end-user.

Since 2009 the European Commission has developed a unique policy for GMES (Copernicus) images,¹⁸ remarking that the policy options should provide for GMES services to be fully and openly accessible, as long as the security interests of the EU and Member States are not affected.¹⁹

In December 2013 the Commission adopted Delegated Regulation 1159/2013 to establish registration and licensing conditions for users and to define the criteria for restricted access to data.²⁰ The regulation attempts to balance the interests of the different stakeholders involved and takes into account existing frameworks and policies concerning data sharing. In precise terms, it adopts an open dissemination policy that guarantees, on the one hand, full and open access to information for end-users and, on the other, permits the absence of any warranty by the supplier.

Precisely, free, full and open access to Copernicus data set is made on the conditions that: i) when distributing or communicating Copernicus dedicated data and Copernicus service information to the public, users shall inform the public of the source of that data and information; ii) users shall make sure not to convey the impression to the public that the user's activities are officially endorsed by the Union; iii) where that data or information has been adapted or modified, the user shall clearly state this; iv) the data remain the sole property of the European Union.

18 see Proposal for a Regulation of the European Parliament and the Council on the European Earth observation program (GMES) and its initial operations 2011–2013 COM(2009)223.

19 The principle of full and open access was approved by the Commission in the Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions Global Monitoring for Environment and Security (GMES): we care for a safer planet, Brussels, 12.11.2008 COM(2008) 748 final; and was welcomed by the Council of the European Union, Conclusions on Global Monitoring for Environment and Security: GMES programme, 2891st Competitiveness (Internal Market, Industry And Research) Council meeting, Brussels, 2 December 2008.

20 Commission Delegated Regulation (EU) No 1159/2013 of 12 July 2013 supplementing Regulation (EU) No 911/2010 of the European Parliament and of the Council on the European Earth monitoring programme (GMES) by establishing registration and licensing conditions for GMES users and defining criteria for restricting access to GMES dedicated data and GMES service information.

Furthermore, in parallel with the principle of open dissemination, Regulation 1159/2013 provides for the registration of users in order to avail themselves of a number of services (such as downloading services). This requirement is not, however, a deterrent to users from accessing data and information. In fact, open dissemination can only be restricted for violation of rights principles enshrined in the Charter of Fundamental Rights²¹ (such as respect for and protection of private life, protection of personal data and IP) or for the security interests of the EU and of its Member States. In the latter case, however, security interests must be balanced with the interests of users and society as a whole to derive environmental, societal and economic benefits from the use of data.

In conclusion, the data sharing policy concerning the Copernicus Programme can be seen as an attempt to match the interests of different parties involved in light of international principles driving space data policy. Such an attempt certainly has some positive aspects, for example in encouraging the use of satellites' data, but it also reveals many gaps, mainly affecting private operators that avail themselves of the data in order to provide services to end-users. In this instance, the total absence of warranties given by the data provider in fact has a direct impact on the private operator using the data to provide a service or product built on space-based information.

3. Data Policy within the EU

Moving to the more general approach of the EU to data, it has to be stressed that European Communities were born with the precise aim of creating a common market among Member States where free movement of the productive factors could be granted and enforced. To this purpose, European institutions adopted hard law and soft law instruments devoted to ensure the free movement of goods, persons (i.e. workers), services and capitals in all fields characterised by an economic impact, leaving apart the intervention in other relevant fields (such as outer space), that had not an economic revenue at that time.

Times have passed, technology has evolved, EU competences have growth and space has become a key area of intervention for both economic and commercial purposes and security issues. However the original aim of EU intervention has not passed away, therefore being enriched with new areas that need the supra-national regulation. The maintenance and the fulfilment of the internal market is still at the centre of the European action and it is experiencing a new life thank to the surfacing of the digital economy and to the relevance currently acknowledged to individual rights.

21 Charter of Fundamental Rights of the European Union, *OJ C* 326, 26 October 2012, pp 391–407. See, in particular, articles 7, 8 and 17.

As already underlined, since 2014 the European Union realised that data are fundamental for the economic and societal growth of the EU,²² their role in the economy is outstanding and their analysis facilitates the optimisation of processes and decisions, innovation and the prediction of future events. Therefore a data economy holds enormous potential and opportunities in various fields which are of the EU interest, ranging from health, food security, climate and resource efficiency to energy, intelligent transport systems and smart cities. Furthermore, the acquisition of data related to the habits of users and consumers has become essential for driving the activity of companies who provide goods and service within the EU (and all over the world). From the above it is self-evident that data economy and data regulation has a deep impact both on the public and on the private sector.

In July 2014 the European Commission opened the path to a European data-driven economy aimed at creating a collaboration between public and private actors in order to ensure that data are accessible and usable (the concept of private-public partnership on data).²³ The Communication proposes measures to accelerate the transition towards a data-driven economy, in particular to develop an EU-wide data ecosystem and promote data-driven innovation. Furthermore, in 2017 another Communication was published with the intent of addressing issues such as the free flow of data across borders and data localisation restrictions, as well as emerging legal issues in the area of new data technologies.²⁴ In this context a basic distinction with reference to the data sharing principle is drawn: on the one hand there is the public sector, on the other hand the private one. If EU legislation has deeply intervened in order to establish a data sharing principle within the public sector information (concerning satellites data but also other information as it will be showed in the following paragraph), the same has not happened in the private context yet, where the sharing of data is still subject to agreements, usually limiting the re-use of the information. In fact, the approach set in the INSPIRE Directive is now expanding to public sector information through

22 The value of the EU data economy was estimated at EUR 272 billion in 2014, or ,85% of EU GDP. These data are still growing and it is estimated that in 2020 its value will increase to EUR 739 billion, that is 4% of the EU GDP. See Communication from the Commission to the European Parliament, the Council, the Economic and Social Committee and the Committee of Regions, “Building a European Data Economy”, COM (2017) 9 final.

23 Communication from the Commission to the European Parliament, the Council, The European Economic And Social Committee And The Committee Of The Regions Towards a thriving data-driven economy COM(2014) 442 final

24 Communication From the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions “Building A European Data Economy”, COM(2017) 9 final; Commission Staff Working Document on the free flow of data and emerging issues of the European data economy Accompanying the document Communication Building a European data economy, SWD(2017) 2 final.

Open Data portals but what is common to the data made available under all these policies is that they relate to data that has been generated by the public sector and thus funded from the public budget. On the contrary, the analysis of the policies carried out in the commercial context shows that companies tend to generate data by themselves and keep the data in-house; when selling the data however, the agreements usually include a clause that limits on-ward re-use.

Once again, to strive a balance between the interests of the community (that pushes for an open data sharing policy) and of the enterprises (that take advantage to hold data that competitors don't) is the key for a fair policy in support to other EU objectives. It is strongly stated that the pursuit of the four freedoms at present can not be achieved if a principle of "free movement of data" is not acknowledged. This principle is felt as a corollary to the obligations imposed under the free movement of services and the free establishment, a rule that shall guide Member States' action with reference to data storage and processing. Such an action will certainly entail the enforcement of rules that introduce the principle in the private context, thus enlarging the obligation from the public sector to the private one.

Follow-up actions have been taken, such as the adoption of the General Data Protection Regulation (conceived as a precondition for the sustainable development of the data economy); a proposal for a review of the Directive on the re-use of public sector information; a proposal on the free flow of non-personal data;²⁵ an update of the 2012 Recommendation on access to and preservation of scientific information; a Guidance on sharing private sector data in B2B and B2G contexts. All these instruments are aimed at enforcing the data sharing principle in accordance with other EU principles and objectives.²⁶

3.1. Data Sharing principle and the GDPR

The General data Protection Regulation is envisaged as a proper revolution in the data protection legislation.²⁷ It is not our purpose to fully analyse the Regulation and its impact in the provision of services within the EU, but it is

25 Proposal for a Regulation of the European Parliament and of the Council on a framework for the free flow of non-personal data in the European Union, COM(2017) 495 final.

26 See also European Parliament resolution of 14 March 2017 on fundamental rights implications of big data: privacy, data protection, non-discrimination, security and law-enforcement (2016/2225(INI))

27 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), in OJ L 119, 4.5.2016, p. 1–88.

worth mentioning its consistency with the data sharing principle that the EU, and the international community, is promoting.²⁸

As well-known it regulates the processing by an individual, a company or an organisation of personal data relating to individuals in the EU, but at the same time it rules on the free movement of such data within the EU in order to strengthen the European Data Economy. Precisely it is stated that improving data protection is the ground for the enhancement of the free movement of data within the EU, since it strengthens consumers' confidence in service provision and legal certainty by providing a uniform harmonised set of rules.

It has to be clarified that even if the right to the protection of personal data is nowadays conceived a fundamental right, it is not an absolute right: it must be considered in relation to its function in society and be balanced against other fundamental rights, in accordance with the principle of proportionality. Here comes into consideration the fact that the economic and social integration resulting from the functioning of the internal market has led to a substantial increase in cross-border flows of personal data, where the exchange of personal data between public and private actors has increased. In this context, as we already pointed out, national authorities in the Member States are being called upon by Union law to cooperate and exchange data so as to be able to perform their duties.

In light of the above, article 1.3 of the Regulation states that “*the free movement of personal data within the Union shall be neither restricted nor prohibited for reasons connected with the protection of natural persons with regard to the processing of personal data*”. It means that a balance between the protection of individuals' rights and the free flow of data principle has been established, by the assumption that data protection has to be functional to the free movement of personal data, by creating a favourable environment for the flow whenever personal data are tackled appropriately in accordance with the Regulation.²⁹

If we limit our analysis to spatial data, however two considerations shall be mentioned: first of all the GDPR only applies to *personal data* controlled and processed by; secondly, it is difficult to apply its three main principles to space data.

With reference to the first aspect, “personal data” is defined as any information that relates to an identified or identifiable living individual;

28 See M.E. Gonçalves, *The EU Data Protection Reform and the Challenges of Big Data: Tensions in the Relations between Technology and the Law*, in *Information and Communication Technology Law*, 2017, p. 90.

29 Moreover, the GDPR also refers to flows of personal data to and from third countries and international organisations. It provides for the application of the EU standard of protection also when personal data are transferred from the Union to controllers, processors or other recipients in third countries or to international organisations.

information coming from space-based systems can be either personal or non-personal, and only in the first case the GDPR has to be applied. Moreover, even when data are personal, they can be rendered irreversibly anonymous in such a way that the individual is not or no longer identifiable: such data are no longer considered personal data.

Moving to the second issue, the first key principle of the Regulation is “*consent*”: personal data may be processed only if the data subject has unambiguously given his prior consent. Do individuals expressly allow satellites to acquire and elaborate data with a personal features? Following the GDPR they should, at least should service providers using space-based applications since they can be defined as data processors following the Regulation. Therefore, the GDPR poses obligations upon the service provider, but what about the owner of space-based data? Is he considered to be the controller of data, and therefore bound to have the consent as stated by the GDPR?

The second principle is “*purpose limitation*”: personal data may only be collected for specified, explicit and legitimate purposes and may not be further processed in a way incompatible with those purposes. Even if Space Programmes usually have a legitimate purpose that drives the collection of data, at least when the space operator is a public entity, however the purpose is usually very general (i.e. environmental protection) and not specifically connected to personal data and individual rights. Once again, it is easy to apply the GDPR’s purpose limitation principle to the specific service provider who uses spatial data, being a data processor, but it is not possible to apply the principle to the data provider, meaning the owner of data. Even more difficult is to apply this principle when private actors obtain data from private satellites; do they have to limit the purpose of the collection of data (either personal or non-personal) from space in order to be consistent with the GDPR?

Then, the third principle is “*data minimisation*”: the processing of personal data must be restricted to the minimum amount of data necessary to reach the purpose. The difficulties in the application of this principle to space data are directly deriving from the considerations expressed with reference to the “*purpose limitation*” principle. Satellites collect a huge amount of data and store them for applications that are not even already existing. How can data be minimised without an enormous loss of potentially useful data? A solution to this problem can be driven from an anonymization or pseudonymization process, which could allow the use of the collected data for statistical purposes, but even this approach will produce a loss of efficiency of data.

Moreover, another problem arises when considering that the data owner of European space-based technologies is the European Commission, since article 2 excludes the application of GDPR to the processing of personal data by the

Union institutions, bodies, offices and agencies; in this case Regulation (EC) No 45/2001 applies.³⁰ It has to be noted that in May 2018 the Council has approved a Proposal for an amending Regulation that recalls the principles of the General Data Protection Regulation.³¹ The connection between the two instruments is self-evident from the Explanatory memorandum, where it is stated that the Proposal wants to align with the rules applicable to Member states, so that whenever the provisions of the Proposal are based on the same concept as the provisions of GDPR, these two provisions should be interpreted homogeneously.

Finally article 23 of the GDPR provides for lawful restrictions to the application of the rules set forth in the regulation when such a restriction is provided in a legislative instrument adopted by the Member State where the data controller or provider is established (or by the EU) and it respects the essence of the fundamental rights and freedoms envisaged and protected by the Regulation and it is a necessary and proportionate in a democratic society. Moreover reasons for restrictions are listed in the rule, being this catalogue mandatory and exhaustive and imposing Member States to explain fully and clearly the reasons upon which the restriction lays. Recital 73 clarifies that among those public interest's objectives that may request a limitation to the application of the Regulation stands also "*an important economic or financial interest of the Union or of a Member State*", therefore admitting a balance between the privacy right and the realisation of the internal market. In any case, this balance has to be assessed by the legislator (national or European), not being left to judges or administrative authorities. Furthermore, those restrictions should be in accordance with the requirements set out in the Charter and in the European Convention for the Protection of Human Rights and Fundamental Freedoms, meaning that the core of the right has to be preserved.

4. Conclusions

If we try to build a connection between space data legal framework and data regulation within the EU, we have to clarify the origins of the normative intervention at both levels, since they condition the aims and objectives of the legislators. Therefore, if the management of data coming from outer space

30 Regulation (EC) No 45/2001 of the European Parliament and of the Council of 18 December 2000 on the protection of individuals with regard to the processing of personal data by the Community institutions and bodies and on the free movement of such data; OJ L 8, 12.1.2001, p. 1–22.

31 Proposal for a Regulation of the European Parliament and of the Council on the protection of individuals with regard to the processing of personal data by the Union institutions, bodies, offices and agencies and on the free movement of such data, and repealing Regulation (EC) No 45/2001 and Decision No 1247/2002/EC, COM(2017) 8 final.

are strictly linked to space exploration purposes, the management of data within the European Union are connected to the evolution of the Regional organization (its competences and aims).

When the first space missions were launched, and data from space were collected, the purpose was to improve human knowledge of earth and its surrounding (as well as to explore outer space). The scientific research aim was preeminent, together with the “*benefit of mankind*” principle, and it still permeates the articles of the UN treaties. The same principles are enshrined in the 1986 UN Remote Sensing declaration, where the data sharing policy reflects the need for a collective answer to the challenges of a changing planet. However, from the Nineties, when the economic relapses of space-based technology were fully acknowledged and the intervention of private entities in space activities was envisaged, States became reluctant to change the normative framework for outer space activities, also in light of the strategic dimension of space assets. The economic and defence interests of States entered the discussion at the international level, leading to a substantial immobility of the normative update due to the multi-lateral feature of the negotiating table. At present no regulation of the acquisition and management of satellites data can be envisaged at the international level, being information from space the new *gold rush* for the States of the international Community. Better would be to say that space-based applications, and therefore the acquired information, are envisaged as the future of national and supra-national economic development. One could agree in saying that the legal framework of space data is obsolete, since it is referred to an era when the potentialities of data were not yet disclosed as well as the space-based activities collecting data were not yet imagined. Even if the data sharing principle is featured as absolute and mandatory, it is only referable to the information that could be acquired at the time when the Treaties were signed, while States would not be willing to move the principle to data acquired through space-based technology.

The origin of the EU and of its policies is dramatically different. It is worth mentioning the reasons at the origin of European Communities in the Fifties, where the need to keep peace among European States was fulfilled with economic and commercial agreements aimed at the realization of a common market with no borders for the movement of productive factors. The path that brought the European Economic Community to the present-day European Union is long and well-known, and it entailed the introduction of many different values (i.e. protection of EU citizens’ rights, promotion of scientific research; protection of the environment etc.) next to the pure economic purpose of its activity. All the amendments brought to EU competences however have been justified by reason of the economic progress of the EU and its Member States, with reference to the globalized world and the modern challenges of society. In this landscape, the advent of space-based technologies and applications is felt as an opportunity for the EU (and for

Member States' enterprises) to improve economic growth and to establish a European leadership in the commercial sector. The same has to be said with reference to the accession of the data economy in society.

Data, no matter their origin and volume, are perceived as an element that will improve European competitiveness in the world's economy. The sharing policy introduced in the recent documents and licence conditions is aimed at raising the well fare of Member States, of European citizens and of European companies. Even when fundamental rights come into consideration, such as the right to privacy, it is well explained that the right is not absolute but has to be balanced with the economic interests of the Union and with the four freedoms.

Moreover, the open access policy granted by EU licence conditions connected to space-programmes is certainly influenced by the international legal framework of outer space data, but it is once again driven by the economic return, since EU citizens and institutions are encouraged to profit from space data in order to elaborate value-added products able to improve European growth and leadership.

In conclusion, we can observe that even if both the international space legal framework and the European legal framework are conformed to the data sharing principle, the ground of the principle is totally different: in the first case, it is the share of knowledge for the benefit of mankind, in the second case it is ancillary to the realisation of the common market. This different perspective also influences the compressibility of the rule: it is self-evident that in the first case the principle is perceived as absolute while in the second case it has to be balanced with other legitimate interests. The operation of balancing the data sharing policy with other relevant policies allows European institutions to update the principle in light of technological and societal evolution. The flexibility of the European legal framework is therefore felt as a value-added feature in the data-sharing society.