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IS THE EU LEGAL REGIME OF REMOTE SENSING DATA PROTECTION FACILITATING THE DEVELOPMENT OF THE MARKET OF APPLICATIONS?

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The paper addresses the issue of probability of the successful development of the European market for remote sensing data and information. In order to do so, two distinct but yet related areas of the law of the European Union are analysed in the first two sections of the paper – rules establishing copyright and database protection on the one hand, and legal regime of handling spatial information held by public entities on the other. The incentives, basic principles and shortcomings of both are identified within the paper. Furthermore, their impact on the existing data policies – on the example of those adopted by the European space Agency – and ultimately on the actual handling of data, access to them, conditions of their use and distribution is highlighted. The third section of the paper contains an overview of the characteristic features and components of satellite remote sensing activities, as well as the conditions under which the successful development of the market for remote sensing data and information is possible. On the basis of the established findings with regard to market evolution and functioning, the effectiveness of the legal regulations in place is assessed. As a conclusion the paper suggests that the necessity to ensure access to remote sensing data and information has to be the main objective of the legal regime governing the behaviour within the relevant market, approach to which will hopefully be unified both within the European Union and the European Space Agency in the coming years.

INTRODUCTION

Most of the regulations the European Union (EU) adopts in the sphere of economic relations are directed at the development and strengthening of the common market. Although the EU does not yet have the capacity to regulate space activities as such,¹ it can intermediately influence the legal framework governing space applications in general and the market for remote sensing data applications in particular. One of the most relevant spheres of law that determine status of information is copyright and other regimes of intellectual property protection. The second important set of legal norms in this regard includes those laying down the protection and the conditions of access to public sector information. Often the two legal regimes overlap. The impact of the existing relevant EU legal norms of these fields of law on the development of the remote sensing data value-adding activities is addressed in this paper.

The paper contains the analysis of the relevant harmonised norms regarding copyright and database protection, compares them to the existing remote sensing data licensing practices, examines EU legal norms regarding public sector and geospatial information, and draws some conclusions as to how satisfactory the established regime of remote sensing data treatment is.

The paper also refers to the data policies adopted by the European Space Agency (ESA) as a means to illustrate how various regulations applied to the same subject-matter may influence behaviour patterns of both institutional and private players on the market

for remote sensing data and information applications. They are also used to assess their capability to increase the economic benefits that the use of remote sensing data offers.

The main argument of the paper is that current EU approach to the protection of information in general and remote sensing data in particular based on the premise that too much proprietary protection does not adequately meet the need to develop a viable market for remote sensing data applications. The paper highlights that the European Union gained powers to harmonise intellectual property laws, and ESA is adopting new data policies that promote open access to remote sensing data. These developments support the idea that use and distribution of remote sensing data and information should not be strangled with too tight property-like protection regimes, but on the contrary should be as unrestricted as possible to foster the development of the market for data products, services and applications.

I. HARMONISED EU INTELLECTUAL PROPERTY PROTECTIONCopyright and criteria of its protection

Copyright is an exclusive right to reproduce, alter, disseminate and represent a work that is an *author's personal creation*. The exclusivity is characteristic to the regime and the most relevant for the relationships that develop on a relevant market of protected subject-matter. According to some of the justification theories, copyright should serve the

promotion of culture and creativity. That is why copyright protection of intellectual works does not depend on their utilitarian functions or their artistic or literary quality. Copyright protects the ‘originality’ – the individual input of the author – of literary and artistic works. The latter are considered not substitutable and not in direct competition among each other. Traditionally, according to both norms of international treaties, EU legal norms and national laws of EU Member States, only the form or expression of a work is protected, and not ideas that underline it.

All Directives that harmonise copyright laws in the EU Member States² reinforce the protection of literary and artistic works as defined in Article 2 of the Berne Convention on the Protection of Literary and Artistic Works.³ The core principle of this approach (‘creator doctrine’)⁴ is that a work can only be protected if it is an intellectual creation.⁵ The Berne Convention provides a non-exhaustive list of the protected subject-matter, but the World Intellectual Property Organisation (WIPO) Copyright Treaty of 1996⁶ explicitly states in its Articles 2 and 5 that ideas, processes, methods of operation, *including data*, are excluded from the ambit of copyright protection.

Within the past twenty or so years EU was harmonising issues related to copyright protection only if and to the extent they would affect the common market.⁷ For this reason there are no unified criteria for copyright protection that are valid among all EU Member States: even the only horizontal Information Society Directive left out of its scope norms regarding the objects of protection, moral rights, as well as the issues of the ownership and transfer of rights. This is due to the fact that the determination of the scope of copyright protection is a matter of national law.⁸ Notwithstanding this fact, the creativity standard was upheld in the Computer Programmes and Database Directives that dealt with the new works of authorship. The Computer former for instance stipulates that in order to be protected by copyright a computer programme has to be “own intellectual creation of the author.” Moreover, most of the Directives refer to the provisions of the Berne Convention and reinforce them, or state that the laws of the EU Member States should be consistent with them.⁹

Database *sui generis* right

The creator’s doctrine of copyright protection, particularly due to its very general terms and absence of clear conditions of application, does not provide a clear answer as to whether e.g. unoriginal databases, like yellow pages or other types of listings, can or should be considered as works under the Berne

Convention and be protected by copyright. These products, apart from being made for very utilitarian purposes, often are a by-product of the main activities of a database maker. This is often the case with the databases that contain spatial data, including remote sensing data and information.¹⁰

Several characteristics of spatial data and information databases lead to their inability to qualify for copyright protection. They include the greater value of the content itself as opposed to the way it is arranged, as well as the necessity to contain as accurate data as possible, and to present the contents in a standardised way for easier and more widespread use, and to be interoperable. Such situation forces the legislators to make the choice between two basic options.

The first is to give database makers more protection to reduce free-riding and piracy and thereby provide them with more incentives to produce more databases in the future. The second is to agree on less protection, particularly in the form of strong proprietary-like regime that will prevent unnecessary restrictions on use of pre-existing ideas and factual information,¹¹ and will enable participation of more actors in the database market by opening-up more data.

Almost 15 years ago EU Commission decided in favour of the property-like protection option embodied within the Database Directive that provides EU database makers with a special –*sui generis*– database right to prevent unauthorised extraction or reutilisation of the content of a database.¹² This type of protection is granted irrespective of database’s eligibility for copyright protection, and is without prejudice to the rights regarding the content of the database. Instead of the principle of creativity, the criterion of protection is that of substantial investment – evaluated qualitatively or quantitatively and manifested in terms of “the skills, energy and money” that has to be spent to make a protected database, as per Article 7(1). The Database Directive in its Recital 19 stipulates only that that the investment must be “substantial enough,”¹³ as well as that it must be an investment in the creation of the database as such (obtaining, verification and presentation of the database content), and not of its contents.¹⁴

Despite the potential application of *sui generis* protection to databases that contain remote sensing data (which is discussed in the next section), this type of protection is hardly effective enough to protect contents of databases for a number of reasons. The key provisions of the Database Directive are vague and allow broad interpretation, which as a consequence causes disparities and inconsistencies in the implementation and enforcement process in the

EU Member States. In particular, the interpretational difficulties manifest themselves in the decisions of the national courts regarding the protected subject-matter and the scope of the *sui generis* database right that often rule different decisions in the disputes regarding identical subject-matter. Furthermore, even of the producers of database do not fully understand what the new right is about.¹⁵ In addition, database *sui generis* protection does not prove to be truly effective in economic terms: a fact that was established in the evaluation report on the Database Directive carried out by the Directorate General Market.¹⁶ Finally, the ‘regionality’ of this instrument coupled with the reluctance of other countries to adopt such form of intellectual property protection, does not add to its effectiveness as a protection mechanism for the databases generated in Europe, but used all over the world, as in case with many databases that contain remote sensing data and information.

Effects of the IP protection legal framework on remote sensing data

How does this situation affect the status of remote sensing data and information? If the presumption that the creativity doctrine is adopted and properly reflected in the laws of the EU Member States is correct,¹⁷ remote sensing data, at least when raw, fall outside the scope of copyright protection. The reasons behind is the nature of the data in question, just a quick look at which explains the applicability problem.

Raw remote sensing data are generated by an automated process: special sensors built into satellites fixate certain information about the earth and send it to the receiving stations on the ground by means of telemetry – a mechanism that enables wireless data transfer. Furthermore, remote sensing data document the reality: satellites cannot think up anything, and only ‘record’ the reflection of the signals they send the earth surface. Finally, without any processing, raw remote sensing data are not comprehensible for the human mind.¹⁸ All three factors support the position that little creative effort is involved in the process of generating raw remote sensing data. Therefore, it is impossible to protect raw remote sensing data by virtue of copyright.

As to the application of the *sui generis* database right it is indisputable that generation of remote sensing data, as a part of overall remote sensing activities, requires substantial investment that includes include production of the satellite, its launch and operation, as well as management and maintenance of the ground facilities that are utilised to task the satellites, receive and store generated data. The cost of producing and launching a remote

sensing satellite alone can amount to tens of millions of dollars¹⁹ and well exceed hundreds of millions of dollars.²⁰ Even the use of micro- or mini-satellites, production of which can be as low as 3 million dollars,²¹ by far exceeds the expenditures that the European courts find substantial enough for a database to qualify for the *sui generis* protection. Nevertheless, strict adherence to the provisions of the Database Directive and their interpretation as per the European Court of Justice (ECJ) and the national courts of EU Member States will in fact favour those database makers who get remote sensing data from third party sources and only after that compile the acquired data into a database. The main reason for such conclusion is that the costs of assembling and launching the satellites are associated with the process of generation or the actual creation of remote sensing data that falls outside the scope of activities that may result in protection of a database by the *sui generis* right.

Inappropriateness and dangers of the artificial stretching of the traditional copyright protection to cover remote sensing data are not the focus of this paper.²² But the advantages of a more open access to and less restricted conditions of use of remote sensing data are mentioning here. Most importantly, reduced proprietary rights over remote sensing data give a chance to companies, who would never be able to launch their own satellites and generate own raw remote sensing data, but have the ability and the knowledgeable personnel to produce value-added geographic information products. This is particularly true with regard to the development of the weather forecast services. Availability of data that aren’t locked by highly property-like regimes enables value-adding companies to enter the market of geographic information products and services, leads to their increased variety, and feeds competition, ultimately contributing to the development of this field of activities. Extension and modification of copyright protection so that it covers the content of works cannot be justified, because this process will change its very foundational principle to protect the original *expression*. If the protection of the content of remote sensing data is of the utmost importance for their generators – and usually this is the case – other forms of protection should be developed and adopted instead.

According to the novella introduced in Article 118 of the EU Treaty of Lisbon, the European legislator was granted with the right to harmonise IP laws as it sees appropriate and necessary. This will hopefully lead to the development and adoption of a unified EU approach towards the subject-matter and conditions of protection of intellectual property assets, including remote sensing data and

information. Such a step will inevitably affect the market for them and their applications. The nature of the reforms will determine whether the impact produced will be positive.

II. EUROPEAN APPROACHES TO TREATMENT OF GEOSPATIAL DATA

INSPIRE Directive and its correlation with copyright protection regimes

A number of norms regarding protection and use of public sector information were adopted by the EU. They are aimed at ensuring access to and regulating conditions of use of government-held or produced data and information. Such regulations can sometimes overlap with copyright and other types of intellectual property protection regime, because they also deal with data and information, as well as products derived from them. This section examines the core provisions of the Directive 2007/2/EC of the European Parliament and of the Council establishing an Infrastructure for Spatial Information in the European Community (INSPIRE).²³

The EU legislator due to lack of the powers to legislate, has not come up with specific rules governing to remote sensing activities and status of data generated in the course of conducting them. The legal document most closely linked to this subject-matter, in particular the handling of the data, is the INSPIRE Directive. Its adoption was driven in the first place by problems regarding gathering, storage, management and use of spatial information. These included restrictions imposed by copyright protection of data, as well as licensing conditions and their pricing. Furthermore, various European authorities experienced lack of coordination amongst themselves. In addition, the Common Market necessitated development of common standards as to the modes of data storage and metadata as one of the pre-conditions of effective re-use of existing data and data-sets and their integration across Europe.²⁴ The INSPIRE Directive operates with the term 'spatial data' and defines them as "any data with a direct or indirect reference to a specific location or geographical area."

The INSPIRE Directive without doubt has impact on satellite remote sensing activities as it aims at development of a spatial information infrastructure, which nowadays should integrate both remote sensing and geographic positioning data. INSPIRE²⁵ aims to establish the framework for the timely and efficient delivery of information integrated within another major European spatial data project – the GMES initiative,²⁶ one of priority themes of which is to contribute to the development of a European geographic information infrastructure.

Both the incentives for the INSPIRE Directive, as well as its aims are quite different from the EU strategy adopted with regard to the protection of intellectual property assets. The INSPIRE Directive put the necessity to share – as opposed to the necessity to protect more within the copyright rules harmonisation pattern – spatial data in the forefront, since this is the way to support environmental policies and decision making. According to the European Space Policy "space represents a significant element of Europe's Sustainable Development Strategy and is relevant to the Common Foreign and Security Policy, supporting their goals by providing vital information on critical global issues such as climate change and humanitarian aid."²⁷

The INSPIRE Directive has a limited subject-matter that encompasses only data that should be used to support environmental causes and activities. The data it integrates (but unfortunately does not stipulate to generate new data) are, with minor exceptions, generated or held by public authorities. In perceiving the aim to achieve interoperability among various national spatial information infrastructures the Directive only prescribes in Article 11 that the network services to discover, transform, view and download spatial data shall be provided at the Community level and be coherent on the national level to the set standards.

In certain aspects the INSPIRE Directive and the EU copyright regulations overlap, and in these instances the EU approach to harmonisation of copyright protection is as a rule the dominating one. For instance, although its Article 14(2) declares the free access as the general principle of data distribution, in its next paragraph it allows producers of large volumes of frequently updated data to charge for their provision, although it remains unclear how to determine whether a provider is large.²⁸ It also allows public authorities to 'reasonably' (without defining the concept) return their investment spent to develop and maintain the infrastructure and to provide services. Most importantly, according to Recital 9, the INSPIRE Directive leaves up to the Member States to regulate the issue of intellectual property rights of public authorities over the data they produce. In essence, the decision to protect public geospatial data through copyright as per Article 13(1)(e) may result in restricted access to data and information-based services using the INSPIRE infrastructure.

ESA data policies as the reflection of the current data regulatory regimes

The European Space Agency (ESA) is one of the most important players in the field of remote sensing

activities, both due to the missions it operates, and to the established cooperative network with domestic and foreign generators of remote sensing data.²⁹ ESA has adopted several data policies that determine what principles govern generation, distribution, use and protection of remote sensing data. They are obligatory for the ESA member states to implement into national data policies and regulations.³⁰ Thereby continuity and consistency of the adopted policies in different jurisdictions are achieved and maintained.

As a rule, ESA retains ownership over the results of all the projects and activities it runs, including the remote sensing data that its satellites generate.³¹ The data policies³² declares organisation's ownership³³ over both primary remote sensing data and information products made for, on behalf or by ESA. It may remain the owner of the information products that are made by third parties if the contribution from its data is substantial and recognisable. These rules are reaffirmed in the ESA general Rules on Information, Data and Intellectual Property.³⁴

According to the Envisat Data Policy ESA, acting in the capacity of an intellectual property owner, prohibits distribution to third parties of any licensed data without its prior consent, or without a prior agreement with a specifically designated distributing entity. Only by virtue of the sufficient – determined on the case-by-case basis – degree of processing that results in the creation of new products by the licensee, *may* a licensee of ESA data claim intellectual property rights over those products and consequently the right to distribute them without any restrictions imposed by ESA. ESA data policies list copyright laws, database protection rules, and other forms of intellectual property rights as the mechanisms of data protection, although none of the data policies describes how exactly they are applicable, leaving the law find its own way.

The nature of data use is the decisive factor in determination of the distribution modes and prices of ESA remote sensing data. Research and development of application in support of mission objectives, as well as uses within ESA functions and for internal ESA purposes are designated as Category-1 Use (in Annex C to the Envisat Data Policy), and all other uses – as Category-2 Use. ESA, not being profit-oriented,³⁵ is responsible solely for the distribution of data under Category-1 Use and provides them, when possible, at the cost of reproduction.³⁶

Distribution of data under Category-1 Use can only take place if their recipient is either working on a project or an institution approved or chosen by ESA. In addition, such data can only be used for non-commercial purposes and may not be distributed to third parties. Detailed rules that form the framework for activities of the licensees under the Category-1

Use are contained *e.g.* in the Terms and Conditions for the Utilisation of Data under Part B of the ESA Category-1 Scheme.

Category-2 Use is designed to create “the conditions for the private sector to invest in new products and services” and use them more extensively. ESA delegates dissemination of remote sensing data under this category to the distributing entities that enjoy freedom of price-determination for their services and products, while ESA maintains the right to set the highest market price for the data. The distributing entities are mandated to provide guaranteed access to the remote sensing data they are in possession of for value-adding companies and service providers. According to Envisat Data Policy they also enjoy the right to market to users directly products and services that include satellite programming, acquisition of data, processing, archiving, cataloguing and dissemination. Apart from the general principles regarding distribution of ESA remote sensing data, ESA data policies do not regulate the activities of the distributing entities.

All in all, ESA data policies that manifest the approach to data treatment – ownership, distribution and use – do correspond and take into account both EU regulations regarding copyright and intellectual property protection, as well as governing relationships regarding spatial information. A very strong emphasis is given to the issue of ownership over remote sensing data and information and the influence of ‘proprietary’ attitude on the modes of their use and distribution.

Right now this situation or approach is in the process of being changed. In 2011 ESA, following the practice of the USA, other nation states, as well as international initiatives like GEOSS and GMES, will introduce the new Sentinel data policy that is already approved by its member states. The core principle of this policy is free and unrestricted access (for both not-for-profit and commercial uses) to data from the remote sensing satellites of the Sentinel series.³⁷ This step may influence the relevant data policies and regulations regarding use and distribution of data within the EU.

III. IS EU MARKET FOR REMOTE SENSING INFORMATION DEVELOPING?

From the market perspective, remote sensing activities can be considered as twofold. The first range of activities is the actual development and operation of remote sensing satellites and systems. It is often driven by strategic need of states to acquire capabilities to address issues like security or monitoring of environment.³⁸ The second is the actual market of remote sensing data that focuses on the provision of customised information products, and on

the development of applications and delivery of information services.³⁹ There are quite substantial differences between the two ends of the activities that in essence have the same beginning.

The processes within the market for remote sensing data are much faster, the environment more competitive⁴⁰ and the responsiveness to the immediate needs of the customers is higher than all aspects of a more bureaucratic and centralised activity of establishing needed infrastructures.⁴¹ Nevertheless, it is of utmost importance to maintain and facilitate the development of both of them. It is therefore essential to reconcile different interests of the players in the two niches of satellite remote sensing activity. One of the most important issues that will contribute to strengthening of the commercial market for remote sensing data and information is to find the balance between the desire of data generators to retain more control over them, and the interest of value-adding companies to have wider access to data with less proprietary rights attached to them.

The market for remote sensing data is characterised by the following key features.⁴² Firstly, participation of universities and small and medium enterprises facilitated by public bodies is significant; most of them have very narrow focus of activities. Due to several factors the entrepreneurial activities are combined with the public support in provision of certain information products and services. The process of developing of a lot of applications heavily relies on access to raw remote sensing data. The information products become more complex and sophisticated are driven by the changes in demand and require systematic investment in innovation.

For the time being public sector remains the main customer for remote sensing data and information products, services and applications and purchases 78% of all marketed products, according to the study by Seiz *et al.* Information from the same study shows that the market players are most active within countries they are established in (53%), sell 32% of their products Europe-wide and export 15% to the rest of the world. Market for remote sensing data is growing: in 2007 revenues from all sales were estimated at 735 million USD, which represented a growth by a Compound Annual Growth Rate (CAGR) of 15% over the period of 5 years.⁴³

Prospective developments

The market for remote sensing data and information is expected to grow and increase the revenues to up to 3 billion USD by 2017 (according to Eurconsult), provided that the positions of the commercial providers of data and information products and services is further strengthened.

Furthermore, to become reality, this estimate needs the support of the market itself on the one hand, and necessitates its development and maturing on the other. The latter is virtually impossible if the particularities of the market are not properly addressed by the legal norms that regulate activities on it and protect the products and services its players offer.

All studies of the market for remote sensing data agree that vertical integration of its players is an inevitable trend of its development. The process of building alliances between data generators and value-adding entities will help the market participants to share proprietary information, unite knowledge capabilities of various fields of science to promote further innovation and improve the quality of the products, services and applications offered. Another trend that is expected to be characteristic to the development of the market is the effort of the primary players within remote sensing market – satellite operators and data generators – to enter the secondary market of data and information services and take advantage of its fast development.⁴⁴

Apart from the integration of participants of primary and secondary remote sensing markets, as well as some of those active in other niches of information market in general, products and services available on it will ‘integrate’ more as well. Apart from integration of remote sensing data from various sources and sensors with information from *in situ* and airborne sources, they will be more extensively combined with navigation satellite signals and telecommunication satellites services.⁴⁵

There are certain issues that have to be resolved or at least acknowledged in order for the development of the market for remote sensing data and information to be successful. One of them is the lack of recognised suppliers, which may have a great impact on the formation of vertical alliances within the data industry. Alongside building the trust to the providers of data products and services, there is a need to raise the level of awareness among potential users, in particular because of the competition of remote sensing data and information with information products from more traditional sources. The last but by far not the least issue concerns the data themselves: products derived from them have to be reliable, accurate, (cost-effective) and usable.

Some of these issues can and should be addressed within the legal regime governing generation, use and distribution of remote sensing data. In particular such challenges as creation of well-functioning integrated market players, development of the new applications, and combination of data from various sources for the production of more sophisticated and efficient applications, can be met

by adopting and enforcing most effective legal rules regarding handling of data.

CONCLUSION

Europe has all the potential for the growth of the market for remote sensing data and information. More satellites are being launched every year both by ESA, as well as EU Member States themselves, GMES will soon become operational, the pressure to compete with data providers and value-adding companies grows. At the same time not all EU regulations properly address the issues crucial to the success of this market. The two main sets of legal norms that affect data distribution and use – the harmonised rules regarding copyright protection and the INSPIRE Directive – are based on different philosophies. The former is driven by the assumption that more protection is better, while the latter pursues the objectives of public good and puts emphasis on integration and sharing of data.

INSPIRE is a first step in forming a broader vision for a European Shared Environmental Information System which includes many applications for environmental management and reporting built on the INSPIRE foundations.⁴⁶ This will also include the activities within GMES and will help integrate European contribution to GEOSS. The latest development pursued by ESA – Sentinel data policies also tend to put more emphasis on the availability of data for both commercial and non-profit objectives. For the author these developments signify the shift of paradigm within both EU and ESA, which is timely and adequate and will serve the purpose of strengthening the European market for remote sensing data and information.

Information and the knowledge that can be extracted from it are essential for economic growth of and efficient decision-making in an educated society. Because remote sensing data and information can bring both social and economic benefits to the society, the balance between interests of various stakeholders should be carefully established. Since accessibility is one of the most crucial aspects of data use, legal norms enabling and ensuring it should necessarily be part of the legal regime that governs remote sensing activities.

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