GEOINFORMATION LAW AND PRACTICE
Recenzenci naukowi
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Preface

This book is one of the first compilations wholly dedicated to the legal issues of using and accessing geospatial information. Considering the scarcity of legal literature on this subject, we invited a number of leading specialists in this field from all around the world to share their experiences and observations in the form of articles collected in this book. Their works are oftentimes based on the legal systems they are acquainted with, nevertheless, this only demonstrates that the issues of “the right to geoinformation” are equally close to all of us and at times require similar solutions.

This book in its original form was intended to be a course book, where individual chapters were to be written by the invited authors. However, it quickly occurred to us that allowing for the intricacy of the whole enterprise (international character of the book, various styles of writing of individual authors practiced in different countries, and multiple issues raised in this book), the outcome will rather be a collective work whose chapters take form of separate articles, edited by us. Wishing to publish a book which is not only a set of freely written articles, we decided to put them in a thematic order, transforming them into consecutive chapters and also expanding the contents by adding some new editing units to it. All of this was accomplished to obtain a comprehensive study of „the right to geoinformation” which is an immensely important and wide body of law. Moreover, the novelty of the topic, as well as its relevance, makes a book treatment of the legal aspects of geoinformation a greatly desired tool for quite a number of students, practicing advocates or attorneys-at-law, and specialists actively taking part in the development of the infrastructure for spatial information.

The Editors would like to express their deep sense of gratitude towards all the authors who made their contribution to this book. Had it not been for their comprehensive help and a welcoming approach to this idea, which crystalized by virtue of their numerous and extensive support, the realization of this project would not have been possible. Hereby, we would like to explain the rationale behind the selection of the topics and their ordering in the book. The first three chapters, written by the Editors, make a general introduction to geoinformation issues. They are a starting point for all subsequent considerations by indicating such matters as: the notion of information, public information, spatial information, the relationship between data, information, and knowledge, basic standard of protection of information in
Preface

terms of intellectual property rights, the notion of an information society, or even a geoinformation society. Chapter IV, prepared by Prof. Gábor Bartha of the University of Miskolc, Hungary – Institute of Geophysics and Geoinformation, initiates considerations on EU law regulating some legal aspects of geoinformation, especially, looks into the INSPIRE Directive. The following chapter, prepared by Mateusz Badowski from the The University of Osnabrück, presents the implementation of the INSPIRE Directive in a comparative view. Next, some issues concerning the contract law and copyright law, are discussed. The first author to engage in the considerations on these topics is Prof. George Cho – the Deputy Director of Institute for Applied Ecology at The University of Canberra, Australia, who by illustrating the general rules for entering into agreement, translates it into the geoinformation reality. Next, Dr Krzysztof Felchner, from the Chair of the Intellectual Property Law at Jagiellonian University in Kraków describes the issues of re-using geodata based on the Polish law. The notion of copyright in relation to geoinformation, liability, and using geoinformation in crisis situations is continued by Prof. Frans von der Dunk, Professor of Law at University of Nebraska, US. This subject matter is concluded by a chapter by Prof. George Cho on broadly understood issues of liability. Afterward, Jürg Kaufmann representing Kauffmann Consulting takes up the issue of the cadastre in geoinformation context and presents it in the light of the Swiss regulations. The next chapter is an account of the Dutch experience of creating a structure for spatial information. These considerations are important because of the fact that they concern creating data bases based on open data and making it available under open licenses. This chapter was prepared by Dr. Jandirk D. Bulens, Matthijs H.G.I. Danes, and Dr Wies Vullings, from the Centre for Geo-Information, Wageningen University in Alterra, The Netherlands. The book is concluded with a chapter by Prof. Joseph Salukvadze and Prof. Vladimer Chkhaidze from the Tbilisi State University, Georgia, who describe the experiences of introducing infrastructures for spatial information in Georgia.

The Editors would also like to express their gratitude towards Prof. Elżbieta Bielecka and Prof. Jerzy Gaździcki for their valuable comments during the preparation of this book, allowing for fine tuning and taking into consideration the most recent directions of scientific development.

The Editors also show their gratitude to the Taylor&Francis publishing house for granting their permission to reprint an article authored by Prof. Frans von der Dunk, which constitutes chapter VIII of this book.

Editors,

Dr Marlena Jankowska
Dr hab. Mirosław Pawełczyk

Katowice, 3rd April 2014
Special Acknowledgements

Also, the Editors and the Authors would like to extend their thankfulness to Prof. Jerzy Gaździcki, the President of the Polish Council for Spatial Information, for his treasured knowledge and experience, which helped to elevate this work’s value even higher. Thanks to his personal and valuable introduction to the topic of geoinformation, and remarks on the coherence and cohesiveness, the book enjoys a standard of a prospectively highly esteemed scientific resource. Professor is to be thanked greatly by all of us for giving us the support, assistance and the gist of the outline of the content of this book.

Editors and Authors

3rd April 2014
Foreword

The book Geoinformation – Law and Practice brings up the issues of the legal conditions of gathering geospatial information and making it accessible by public administration bodies, and also it presents the connections between the implementations of the INSPIRE Directive and other legal acts which regulate the access to information in general, and to its spatial aspect.

It is without doubt one of few non-serial publications so broadly discussing legal issues connected with re-using and making geoinformation available not only in Poland, but also in other countries such as Germany, Switzerland, the Netherlands, Australia and Georgia. The problems brought up by the authors are tremendously important and relevant in the face of the dynamic growth of the geoinformation business, the formation of geo-social networking, open data, and free and open-source software, as well as the more frequent use of geographic information by public administrations, businessmen, and citizens to aid in decision-making. Rich case law in respect to the re-use of geospatial information in Poland allows the reader to understand the complex matter of making spatial information available by public administration bodies. In this aspect, it is undoubtedly an innovative study.

Chapter I introduces the reader to the issues of the book, namely it explains such notions as spatial information, spatial data, or geographic information systems. The authors produce definitions of these terms found both in literature and legislation. The constitutional rights of a Polish citizen to access to information and the issues of accessing spatial information being also public information are given special attention by enumerating a number of court decisions which lead to a closer understanding of the difference between information and a public document. The discussion on accessing spatial information (henceforth geoinformation) is continued in Chapter II and Chapter III, which are largely dedicated to the information society, and in particular to its right to information and network services which facilitate the access to it. Chapter III concludes with a list of scientific and economic branches which cannot exist nor develop without the access to geoinformation.

Next two chapters bring up the issues of accessing spatial information regulated by directive 2007/2/EC of The European Parliament and The Council of 14 March 2007 establishing an Infrastructure for Spatial Information in
Foreword

the European Community (INSPIRE), commonly known as INSPIRE Directive. Therefore, Chapter IV states the reasons behind establishing a European infrastructure for spatial information and general characteristics of standards established by the International Standards Organization (ISO) in the scope of geographic information, i.e. ISO 19 100 standards series. It briefly describes the scheme of dependencies between various documents drawn up to implement INSPIRE, thematic scope of directive 2007/2/EC, and implementing rules. The chapter also mentions all frameworks and technical documents concerning INSPIRE and an implementation schedule.

Various approaches of Member States to the transposition of INSPIRE Directive are considered in Chapter V. The Author presents selected legal aspects concerning the access to spatial information in the Polish and German legal systems. The chapter concludes with a statement that the acts implementing the INSPIRE Directive to domestic legal orders are very similar to each other, and the differences concerning, among others the definitional scope, stem from the choice of legislative techniques.

Chapter VI contains detailed characteristics of various kinds of contracts in connection with the access and dissemination of spatial information. In particular, the author states which cases should be regulated by law and also proposes the structure of the contract itself. The author discussed types of contracts and licenses drawn up with providing access to geoinformation products and services and application software. One notion of a particular type of Web 2.0 service was especially emphasized, namely cloud processing. This chapter is recommended to all who are a party to such a contract to become more aware of these parts of the contract which require special attention.

Re-use of spatial data is the topic of Chapter VII. The Author explains these laws of Polish Infrastructure for Spatial Information Act of 4th March 2010 which relate to spatial information, data, and services, and confronts them with the Access to Public Information Act of 6 September 2006. While discussing individual topics, the author refers to the decisions of the Supreme Administrative Court and adds his own comments. The chapter ends with a statement that the amended directive 2003/98 on the re-use of public sector information will be an opportunity to remove any interpretative doubts concerning making spatial data available from the Polish legal system.

Using geoinformation is inseparably related to quality assessment, emphasizing reliability and accuracy. This matter is considered in Chapter IX. The Author discusses the problems of reliability and accuracy of official data, real-time data, data made available on various mobile devices, and also data limitlessly gathered and stored by communities (crowd-sourced & Volunteered Geographic Information). The chapter also explores the issue of cloud processing. The summary con-
tains an opinion that current regulations are not fitted to modern technologies of providing and processing data, and do not allow for security in geodata trade.

**Chapters X and XI** describe some legal aspects of using geoinformation in Switzerland and the Netherlands, respectively. The Authors presented historical background, acts regulating the access to geoinformation, organizational structure responsible for the implementation of INSPIRE Directive. Also, they produced some examples of domestic projects which rely on spatial data such as Land Parcel Identification System (LPIS), which is being developed in the whole European Community for better control over agricultural funding.

**Chapter XII** illustrates the condition and prospects of using geoinformation in Georgia. The Author explains the reasons for the delay of building geoinformation resources in Georgia, and many problems with the access to maps and other sources of information. He also discusses the principles of Georgian Infrastructure for Spatial Data and the use of geoinformation by the public administration.

The book can be read “from cover to cover” in order to acquaint oneself with various legal problems concerning geoinformation discussed in consecutive chapters. Also, the reader may choose specific chapters to become familiar with such legal issues as gathering and re-use of spatial data in such countries as Poland, Germany, the Netherlands, Switzerland and Georgia.

*Dr hab. Elżbieta Bielecka, Prof. WAT, Eng.*
Warsaw, 23 October 2013
Letter from India

The recent past has witnessed an unprecedented growth in technology advancements. This combined with power of geo information has brought a paradigm shift in implementation of IT solutions. The geospatial products, such as image services having capability to show minute objects on earth, 3D views, accurate positions and accessible over the mobile technologies, from world across have created interest and curiosity of one and all to look at the information presented. The way these products being deployed innovatively, it is beyond the imagination how the futuristic scenario going to be.

Technology has vital role for India to grow on the path of self reliance. E-governance, in this regard is one of the major IT initiative from the Indian government towards developing transparency, inclusive growth, social audit and citizen participation. Vast heritage of spatial data generated from survey procedures, continuously evolving space based programs and GPS technology are seen as potential source to fulfil the objectives of e-governance through mission mode projects in the priority sectors. Currently the geoinformation and data sets from various sectors are in vertical silos and efforts are being made to integrate these data sets enabling access and sharing across the sectors. National Data Sharing and Access policy (NDSAP 2012) is a step taken for proactive and open access to spatial as well non spatial data generated through public funds available with different ministries/ departments. This mandates release of data as per the policy through an enabling mechanism. The use of spatial data available within various ministries/departments is governed through policies from concerned sectors e.g. Remote Sensing Data Policy, Map Policy etc. The major concerns, however, is for the geo products available from free and open source domain and are not covered by any policy framework. A vision document on National GIS (NGIS) with emphasis on need of geo information for e-governance program was prepared under the aegis of Planning Commission submitted during October 2011. A detailed plan for the same has been proposed through participation of a few ministries and is under active consideration for implementation.

The book “Geoinformation. Law and Practice” is the need of the hour towards building an insight to understand the present day scenario. Various issues relating to practices being adopted for geo information creation and use have been carefully identified and subject systematically segregated in different chapters.
Letter from India

The subject has been well introduced in initial chapters and defines its linkage to INSPIRE objectives followed by issues relevant on use/re use of information, accuracy and reliability, real time data, problems relating to access and sharing of data including technical and legal aspects. Most of the issues brought out are equally of concern in Indian scenario. The book practically covers most of the issues relating to geo information and demonstrates deep understanding of authors from across the countries on the issues highlighted. One of the strongest aspects of the book is that all the authors from different regions recognize the need of geoinformation for future growth, evolving the concept of “Right to geoinformation”; they show their concern towards the question on how to channelize the growing use of technology for peace and welfare of the humankind.

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List of abbreviations

Most common legal acts referred to

u.i.i.p. Polish Act of 4 March 2010 the infrastructure for spatial information (Journal of Laws [Dz.U.] No 76 Item 489)

GeoZG Gesetz über den Zugang zu digitalen Geodaten (BGBI. I p. 278)


**List of abbreviations**

*Other abbreviations*

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Full Form</th>
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<tbody>
<tr>
<td>cf.</td>
<td>lat. confer (compare to)</td>
</tr>
<tr>
<td>CJEU</td>
<td>Court of Justice of the European Union</td>
</tr>
<tr>
<td>et seq.</td>
<td>lat. et sequens (and the following one or ones), also as: ff.</td>
</tr>
<tr>
<td>ETS</td>
<td>Court of Justice of the European Union (also as TSUE or CJEU)</td>
</tr>
<tr>
<td>EU</td>
<td>European Union</td>
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<tr>
<td>GI</td>
<td>Geoinformation</td>
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<tr>
<td>GIS</td>
<td>Geoinformation system</td>
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<tr>
<td>NSA</td>
<td>Naczelny Sąd Administracyjny (<em>eng.</em> Supreme Administrative Court)</td>
</tr>
<tr>
<td>SDI</td>
<td>Spatial Data Infrastructure</td>
</tr>
<tr>
<td>WSA</td>
<td>Wojewódzki Sąd Administracyjny (<em>eng.</em> Voivodship Administrative Court)</td>
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Chapter I. The notion of geospatial information – several preliminary remarks, spatial information and public information

1. The notion of geospatial information

The need to define the notion of geospatial information seems to be irrevocable as the spatial information (so called geoinformation, abbrv. GI) is a notion used by both, The INSPIRE Directive and the Polish Act of 4 March 2010 on the infrastructure for spatial information (henceforth: u.i.i.p.). It is not our goal, or our ambition, to describe terms, which are being applied/used by people creating the systems of geospatial information, in a comprehensive manner. It shall be born in mind, that the goal of the book is to turn a spot light on legal issues which emerge out of the shadows once we try to supply legal qualifications for the phenomena of creating and gathering geospatial data and setting rules for accessing and applying it. The authors of this chapter would like to, however, give a sense of what geoinformation is, at least insofar as we need it for any legal analysis.

In a nutshell, geoinformation is defined as information obtained through the interpretation of geospatial data.1 In the world literature, many proposals for defining GI have been given.2 However, it is important to note that in Poland the definition of geospatial information has been coined by J. Gaździcki, who depicted it as “information about a location, geometric properties and spatial relations of object, which might be identified in relation to the Earth. The term of an object is used in a broad meaning, encompassing not only permanent, natural and artificial objects, but also natural, social and economic phenomena”.3 Accessing this data is possible with the use of a geospatial information system which is described as a system of

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“obtaining, gathering, verifying, integrating, analysing, transferring and sharing spatial data, in the broad sense it comprises the methods, technical means, including hardware and software, spatial databases, organizations, financial reserves, and people interested in its functioning”.\textsuperscript{4} According to J. Pasławski’s approach „a geographical information system can also by understood as a specific model in the real world perceived as a set of geographical objects. In this model, individual types of objects and their interrelations are represented by relevant data layers connected with relations determined by the author of the system”.\textsuperscript{5} Each subsequent layer covers the same area, and contains one type of data, for example areas’ and roads’ manner of use, hospitals, population density. In the literature, a strong emphasis is put on the organisational aspect of the data which is that e.g. remote sensing or photogrammetric images can constitute layers.\textsuperscript{6} This way of data organisation is often compared to a set of thematic maps, drawn on a transparent foil that can be put one on top of the other. Individual layers can be analysed separately or together with other thematic layers.\textsuperscript{7}

The INSPIRE Directive, in its Art. 3 item 1, introduces the notion of the „infrastructure for spatial information” which it denotes as „metadata, spatial data sets, and spatial data services; network services and technologies; agreements on sharing, access and use; and coordination and monitoring mechanisms, processes and procedures, established, operated or made available in accordance with this Directive”. The infrastructure is referred to in such terms as metadata (Art. 3 item 6 of the Directive), spatial data (Art. 3 item 2 of the Directive), and spatial data services (Art. 3 item 4 of the Directive) which mean:

- „metadata” – information describing spatial data sets and spatial data services and making it possible to discover, inventory and use them,
- „spatial data” – any data with a direct or indirect reference to a specific location or geographical area,
- „spatial data services” – the operations which may be performed, by invoking a computer application, on the spatial data contained in spatial data sets or on the related metadata (the network of the services consists of discovery ser-

\textsuperscript{5} J. Pasławski, Wprowadzenie do kartografii i topografii, Wrocław 2006, p. 373.
\textsuperscript{6} To find out more about the individual layers and the structure of the Geoportal, cf. J. Dygaszewicz, GEOPORTAL.GOV.PL..., p. 43 et seq.
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services view services, download services, transformation services and services allowing spatial data to be invoked.\(^8\)

Pursuant to item 5 of the INSPIRE Preamble, the INSPIRE infrastructure should be based on the infrastructures for spatial information that are created by the Member States and that are made compatible with common implementing rules and are supplemented with measures at European Community level. These measures should ensure that the national infrastructures for spatial information created by the Member States are compatible and usable in the European Community and in a trans-boundary context.

Without going into any technical detail, it shall be noted that the process of creating the spatial information system can be divided into several stages. Shedding some light on this process seems to gain relevance at least from the legal point of view. It is important to note, that the analysis of the act of creation enables us to set aside such issues as the ownership of databases as well as it’s “copyrightability”. In short, a database consisting of geospatial data is being elaborated through many activities and on many different levels especially of:
1) obtaining and gathering data (direct measurements, methods and techniques of photogrammetry and remote sensing, data from existing maps),\(^9\) and
2) entering data to the database,
3) processing and analysing data,
4) sharing the results of the analysis,
5) using the results there of afterwards.

J. Pasławski notices that the abovementioned stages are complemented by the following elements: geographical database, computer hardware, system and database managing software, packages of accompanying utility software, creators and users of the system.\(^10\)

\(^8\) See more: *T. Kubik*, GIS. Rozwiązania sieciowe, Warszawa 2009, p. 166 et seq.


2. The normative frame of geospatial information in Poland

The implementation of the INSPIRE Directive into the Polish law was conducted by adapting the definitions and concepts from the Directive in a considerably high manner. Pursuant to Art. 3 item 2 sec. of u.i.i.p. “the infrastructure for spatial information” means “spatial data sets described by metadata, and relevant services described by metadata, technical means, processes and procedures which are used and made available by the leading organs, other administrative bodies, and third parties which take part in their creation process”.

To be precise, it has to be noted that the notion of “spatial information” occurs especially in the INSPIRE Directive and the implementing act on the infrastructures for spatial information. This is understandable if we take a look at the correlation from a systemic point of view. It needs to be emphasized, though, that, as a matter of fact, this term is used in many more legal acts in the Polish law system. It seems to be an issue of a crucial matter in as far as it makes us realize the chain of legal references concerning this kind of information. The fact that this notion is used in more than just one legal act shows its practical significance, which is a reflects legal regulation. Aside from the u.i.i.p. and regulations surrounding the Act, the notion of “spatial information” is also used in:

- Act of 28 April 2011 on the information system in health protection (Journal of Laws [Dz.U.] of 2011 No. 113 Item 657, referred to as u.s.i.w.o.z.), cf. Art. 4 sec. 5 u.s.i.w.o.z., Art. 5 sec. 4 u.s.i.w.o.z., Art. 36 sec 5 u.s.i.w.o.z.
- Act of 15 April 2011 on the educational information system (Journal of Laws [Dz.U.] of 2011No. 139 Item 814, referred to as u.s.i.o.), cf. Art. 4 sec. 2 u.s.i.o.
- Act of 7 May 2010 on the support of telecommunication networks and services (Journal of Laws [Dz.U.] of 2010 No.106 Item 675, referred to as u.o.w.r.u.s.t.), cf. Art. 29 sec. 5 u.o.w.r.u.s.t.
- Act of 4 February 1994 on Mining and Geological Law, (Journal of Laws [Dz.U.] of 2005 No. 228 Item 1947 referred to as former p.g.g.) in force until its rescission by the act of 9 June 2011. Mining and Geological Law (Journal of Laws [Dz.U.] of 2011 No. 163 Item 981, referred to as p.g.g.), cf. Art. 102 sec. 1 of former p.g.g. in connection with Art. 102 sec. 3 former p.g.g.

In the literature, it has been emphasized several times that Australia was a forerunner in the field of creating an infrastructure for spatial information, where administrative bodies in 1986 signed an agreement on sharing geographical data and collaboration in order to obtain them. The next country to show initiative was the United States. Presently, an infrastructure is being built up in several dozen
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countries all over the world.\(^\text{11}\) When it comes to Poland, the issue of developing a special information system is not new. Only in 1989, the Ministry of Spatial Planning and Construction delegated the preparation at the ministerial level of the research-and-development programme “Subsystems of the local information for spatial planning”, that was coordinated by the Head Office of Geodesy and Cartography in Warsaw.\(^\text{12}\)

3. Spatial information as public information

The PSI (Public Sector Information) Directive relates to the scope of “public sector information”.\(^\text{13}\) Although the directive does not define this term precisely, the scope of its meaning can be derived from some directive’s provisions, which shape this purview from both objective (what it concerns) and subjective side (to whom it concerns).\(^\text{14}\) First of all, it has to be pointed out that the public sector information is an information received from the public sector bodies of a Member State.\(^\text{15}\) It is a rather significant limitation of a subjective character. Compliant to Art. 2 item 1 of the PSI Directive the „public sector body” means the State, regional or local authorities, bodies governed by public law and associations formed by one or several such authorities or one or several such bodies governed by public law. Pursuant to Art. 2 item 2 of the PSI Directive, it has to be assumed that „body governed by public law” means any body that is:

a) established for the specific purpose of meeting needs in the general interest, not having an industrial or commercial character; and

b) having legal personality; and

c) financed, for the most part by the State, or regional or local authorities, or other bodies governed by public law; or subject to management supervision by

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\(^\text{11}\) E. Bielecka, Co infrastruktura danych przestrzennych i INSPIRE oznacza w praktyce dla samorządów i społeczności lokalnych?, elektroniczna Administracja, No. 1-2, 2008, p. 57-58.

\(^\text{12}\) J. Gaździcki, Systemy..., p. 139.


those bodies; or having an administrative, managerial or supervisory board, more than half of whose members are appointed by the State, regional or local authorities or by other bodies governed by public law.

The public sector information in its objective scope sustains numerous exclusions taken into consideration that in the Art. 1 sec. 2 of the PSI directive many exceptions are introduced which are not referred to by the directive (it concerns also documents for which third parties hold intellectual property rights). Nevertheless, one can infer that information receives a public character by virtue of the type of body of origin. The semantic scope of spatial information intersects with the semantic scope of the notion of public information, therefore, one should consider, whether, under certain conditions, the geospatial information shall fall under the regulations of PSI directive.16 This issue raised some doubts in the interpretation practice under Polish Act of 6 September 2001 on the access to public information (referred to as u.d.i.p.). In order to illustrate the troublesome interpretation struggles that take place under Polish law before Polish courts, a few relevant holdings need to be cited. It needs stressing out that Polish judicature seems to be still missing the whole understanding of the situation, which happens to fall simultaneously under three different regimes of such legal acts as: u.i.i.p., u.d.i.p. and pr.aut. Though we read in Article 2 of the u.i.i.p that its provisions do not affect inter alia the regulations of intellectual property, it is still difficult to infer general rules applied to the dissemination of spatial data. To provide a closer look at this subject matter, a few significant holdings have been selected and cited extensively. The brief overview of judgements envisage a scope of contrary decisions given in respectively similar cases. In these cases, we read as following:

- “the Computerized Map of Hydrographic Division of Poland (MPHP) is a hydrographic database and is a visualization and a cartographic representation of these data. As a database, MPHP is a set (collection) of data arranged in an established way, structured according to the assumed data model. For a set of specifically ordered hydrographic data concerning the territory of Poland, including the river basins of the rivers Vistula and Oder outside the border, being at the same time a visualisation and cartographic representation of these data, constitutes a public information and is subject to sharing compliant to the rules described in the public information act”, WSA verdict of 2 December 2005, file ref. No. II SAB/Wa 154/05, lex No. 189839,

- "public information is every message delivered by or referring to broadly understood public authorities, or delivered or referred to other subjects discharging functions in the scope of carrying out the tasks of public authority and

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managing communal assets or the property of the State Treasury. In the light of the access to public information act, an information protected by the Copyright and Neighbouring Rights Act of 4 February 1994 is not considered to be a public information. The Computerized Map of Hydrographic Division of Poland as a copyrighted item is not public information in the view of the Act on access to public information of 6 September 2001" WSA verdict of 17 July 2007, file ref. No. II SAB/Wa 58/07, lex No. 368237,

"not only the documents directly edited and created by the public administration bodies are considered to be public information, but also of such character are documents used by the body to perform legal tasks, even if the copyright belongs to another entity. For it is of rudimentary significance that these documents are used to perform public tasks by specified bodies, and were created at their request. The point of the whole thing is not a disposal of copyright, it is rather the matter of access to a document created by request of the public body in order to perform public tasks. It shall be pointed out that this stance has been well-grounded in the interpretation of the administrative courts for a number of years (inter alia verdict of 9 February, file ref. No. I OSK 517/06; of 7 December 2010, file ref. No. I OSK 1774/10; of 18 September 2008, File No. I OSK 315/08). In this case, it should not raise any doubts that the maps connected with the works of "Directions of spatial development" and "Conditions for spatial development" constitute public information. They were created for the need of a specified public task, by the request of a public administration body. Therefore, sharing the data does not transfer copyright, but rather provides a realization of access to public information pursuant to abovementioned Act on access to public information", WSA verdict of 15 July 2011 file ref. No. I OSK 667/11,

"in the view of the Court, the body wrongly assumed that public information requested by the plaintiff is subject to copyright protection in the scope that disables (excludes) its sharing as per the access to public information act [...] However, in Art. 4 of the pr.aut., the legislator provided for copyright disclaimers, deciding that the following do not constitute a copyrighted item: 1) normative acts or their drafts; 2) official documents, materials, signs, and symbols; 3) published patents or protective specifications 4) simple press information. The maps "Directions of spatial development" and "Conditions for spatial development" in the form of colour print are enclosed to the conditions and directions of the spatial management study, being an integral part of the official document. If it is so, in the view of the discussed regulations they are not copyrighted items [...] Therefore, also papers, maps, expert opinions enclosed to the documents and created at the request of an administrative body are not protected by copyright in the scope that it is impossible to make them
available by the way of the access to public information", WSA in Kraków verdict of 22 November 2010. file ref. No. II SAB/Kr 114/10,
– "in the view of the Court, the body wrongly assumed that public information requested by the plaintiff is subject to copyright protection in the scope that disables (excludes) its sharing as per the Act on access to public information [...] Also, the Court does not share the opinion of the Mayor of Rabka Zdrój concerning the scope of exclusion from the regulation of the access to public information act with the reference to the Art. 4 of the pr. aut. The Act on access to public information refers to other acts in the matters not regulated by it, but also it contains a very broad objective scope – in principle, every piece of information concerning public matters is public information. The regulation of Art. 6 u.d.i.p. contains an example catalogue of such information, directly indicating that public information is subject to sharing, especially information concerning the plans of the regulatory and executive authorities actions, and normative acts design (Art. 6 sec 1 item 1 letter a and b of u.d.i.p.). If a public administration body, in the course of fulfilling public tasks, orders the creation of any documents used to or applied in the scope of the performed public task, it is public information. In the course of designing the draft of the act concerning the research on conditions and directions of the spatial planning of a given district, the body (bodies) of a given district needed maps in various versions (e.g. vector, digital, analogue). It means that the maps were or could have been helpful in accomplishing a given public task by the self-government body (passing the research act). To admit that the maps are public information, it is of no significance whether they were prepared by the body itself (auxiliary administrative body), or requested to be prepared by third parties. The issue of the design studio claiming copyright to some versions of the map does not influence recognizing such maps to be a public information item", NSA verdict of 12 December 2012. file ref. No. I OSK 2149/12.

WSA in Warsaw, verdict of 24 October 2012 file ref. No. II SAB/Wa 245/12
In the light of the Art. 40 sec. 1 of the Geodetic and Cartographic Law, the national geodetic and cartographic resource serves the national economy, national defence, education, culture, environmental protection, and, what was emphasised, the citizens’ needs. The topographic maps in this resource, disregarding its form (traditional or electronic), are cartographic documents (Art. 5 item 6 of the abovementioned act). Cartographic documents, as knowledge recorded and signed by an authorised worker, and added to the geodetic and cartographic dataset, bear the features of official documents. Pursuant to Art. 6 sec. 1 item 4 letter a) of the Act on access to public information act, public information concerning public data is subject to sharing, including the
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content and the form of the official document. As an example, NSA in the decision of 30 August 2011 File No. I OSK 1048/11 stated that the maps included in the research for spatial development are public information, for they were prepared for the needs of the realization of a public task. Also, the information on the land, buildings, and apartments found in the land and building survey are public information – as stated by WSA in Warsaw, in an effective verdict of 13 January 2012. File No. II SAB/Wa 353/11 (the verdicts are published in the Central Base of Rulings of Administration Courts) (Centralna Baza Orzeczeń Sądów Administracyjnych).

As this has been illustrated, the relationship of u.d.i.p. and pr.aut. is not certain as far as maps are concerned. Therefore, it is advisable to fine-tune the notion of public information here. Compliant to Art. 1 sec. 1 u.d.i.p. every information concerning public matters is public information in the view of the act and is subject to sharing and re-use under and in accordance with this act. Despite the fact that an example list of subjects obliged to share public information is placed in Art. 4 sec. 1 u.d.i.p., the semantic scope of this term is not explicit. The attempt to narrow down this scope was made by the jurisdiction which worked out a coherent approach presented in numerous decisions. Hereby, it is worth pointing out some decisions which may be significant to the access to the documents containing spatial information.

a) Public matter
   - "whether a control protocol is an official document in the view of Art. 6 sec. 1 item 4 letter a) of the act of 2001 on the access to public information is established by its contents. It has to be the type of information as mentioned in Art. 1 sec. 1 of the act, namely, information concerning a public matter. The notion of a public matter may be in some sense equated with all actions (omissions) of subjects performing tasks counted to be of a broadly understood public interest" (NSA in Warsaw, verdict of 7 October 2009, I OSK 209/09, lex No. 573260),

b) Information and an official document
   - "a given piece of information is categorized as subject to sharing in the view of the Act on access to public information by the material criterion, that is, the contents and character of the information. Public information has a broader semantic spectrum that official document, and the access to public information cannot be equated and narrowed down only to the access to the documents. Not

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only are the documents directly edited and obtained by the public administration bodies considered to be public information, but also the documents used by the bodies to perform legal tasks entrusted with them are described as such. The notion of an official document is different than the notion of a document containing public information. Of crucial significance is not the fact whether a given document was created by a public official in the light of the Penal Code […], but mostly the fact whether it contains public information" (NSA in Warsaw, verdict of 29 February 2012, I OSK 2215/11, lex No. 11222883),

- "the notion of an official document is different from the notion of a document containing public information, as the latter is a broader one" (NSA in Warsaw, verdict of 17 June 2011, O OSK 490/11, lex No. 990257),

- "the word "information" has a much more broad semantic scope than the word "documents", so that the access to public information must not be narrowed down and equated to the access to documents" (NSA in Warsaw, verdict of 9 December 2010, I OSK 1797/10, lex No. 1113061),

- "there is a need to distinguish between the notions of "public information" and its carrier. The information is always described as knowledge about facts, while it can be recorded on various carriers. The body is obliged to make public information accessible, but nor necessary on the carrier which contains it." (NSA in Warsaw, verdict of 2 June 2011, I OSK 281/11, lex No. 990241),

- the word "information" shall be interpreted as a transfer of knowledge, certain statements concerning facts. Since public information concerns the facts, it surely constitutes the content of the documents created by the public administration bodies and subjects not being public administration bodies, also the content of opinions and evaluations performed by them, regardless of the target subject and the matter of concern. A piece of information concerns therefore the contents of the documents" (WSA in Warsaw, verdict of 9 June 2010, II SAB/Wa 55/10, lex No. 668326),

- "the word "information" shall be interpreted as a transfer of knowledge, and certain statements concerning facts – regardless whether the statements of a public administration body are true or not. The forms of information in such understanding include oral or written statements. In principle, the piece of information familiarized by the entitled citizen does not base on the direct encounter of the citizen with the reality in question, but rather with the description of this reality, obtained by the replying body" (WSA in Cracow verdict of 28 February 2008, II SA/Kr 1292/07, lex No. 505369),

- "a given piece of information is categorized as subject to sharing the view of the Act on access to public information of 2001, by the material criterion, that is the contents and character of the information" (WSA in Lublin verdict of 16 December 2010, II SAB/Lu 75/10, lex No. 756119),
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- “every kind of materials, prints, designs, etc. being in the possession of the body do not constitute public information provided their intellectual contents was not used or utilized in any of the tasks, thus did not acquire the traits of official documents” (WSA in Warsaw, verdict of 29 June 2010, II SAB/Wa 91/10, lex No. 668353),

- "public information concerns the sphere of facts. It is of no significance which way the documents being such information came into the body's possession and which matter it concerns. It is important that it is used for the realization of the public tasks by the body and directly refer to it. It means that such documents have to be connected to the sphere of facts that occurred on the side of the body. Whereas, whether the document is considered to be public information is not established by placing it in the administrative case files, but rather by its contents" (NSA in Warsaw, verdict of 9 December 2010, I OSK 1797/10, lex No. 1113061),

- "the acts understood as a set of various pieces of information, that is such that are public information, and such that are not, are not public information in their entirety, and as the matter of principle, should not be made available in their entirety. There are no grounds to claim that "the right to access the case files" results from Art. 3 sec. 1 item 1 of the act of 2001 concerning the access to public information. The access to case files of the cases conducted in front of the state bodies is beside the regulations of the Act on access to public information" (NSA in Warsaw, verdict of 7 October 2009, I OSK 209/09, lex No. 573260),

- "not only the documents directly edited and created by the public administration bodies are considered to be public information, but also of such character are documents used by the body to perform legal tasks, even if the copyright belongs to another entity. For it is of rudimentary significance that these documents are used to perform public tasks by specified bodies, and were created at their request. The point is not that they transfer copyright, it is rather the matter of the access to a document created by request of the public body in order to perform public tasks" (NSA in Warsaw, verdict of 15 July 2011, I OSK 667/11, lex No. 969478; NSA in Warsaw, verdict of 7 December 2010, I OSK 1774/10, lex No. 745166),

- "the citizen is entitled to obtain knowledge about the public matters. The right to acquire this knowledge in the form of a right to the access to information does not include information carriers that is forms in which information occurs, e.g. documents. Documents are main information carriers, for that reason the right to inspect a document means the right to possess or familiarize its content, and not the right to possess the document itself" (NSA in Warsaw, verdict of 31 May 2004, file ref. No. I OSK 205/04, lex No. 158987),
c) **Expert reports**
   - "expert reports are not public information if they do not concern a specific file being a subject of an ongoing legislative process. These are, however, internal documents used for gathering information which in the future can be used in the decision-making process" (NSA in Warsaw, verdict of 27 January 2012, I OSK 2130/11, lex No. 1126276),
   - "expert legal reports, requested by the Chancellery of the President of the Republic of Poland, for the needs of the President's decision about signing the social insurance act is public information in the view of Art. 1 and Art. 6 of the Act on access to public information" (WSA in Warsaw, verdict of 3 August 2011, II SAB/Wa 193/11, lex No. 951104),
   - "all expert reports, both internal and external (created on demand of the Chancellery of the President of the Republic of Poland) should be construed as public information in the view of Art. 1 and 6 of the Act Access to Public Information" (WSA in Warsaw, verdict of 3 August 2011, II SAB/Wa 187/11, lex No. 951096),
   - "expert reports created for the needs of an administrative case, even if they concern persons discharging public functions, or civil contracts, alternatively, authorizations are not official documents. Despite this, if such documents contain public information, the access to them is regulated by the Act Access to Public Information of 2001" (NSA in Warsaw, verdict of 17 June 2011, I OSK 490/11, lex No. 990257),
   - "a legal opinion made for the use of a public administration body within the legitimacy of future bringing proceedings in a specified civil case does not constitute public information, in the view of Art. 1 sec. 1 of the Act Access to Public Information" (NSA in Warsaw, verdict of 16 June 2009, I OSK 89/09, lex No. 590773),
   - "not every legal opinion made by a public administration body is public information. Whether such opinion is subject to providing access to it as per Access to Public Information Act, is established by the purpose of its issuance" (NSA in Warsaw, verdict 16 June 2009, I OSK 89/09, lex No. 590773),
   - "public information also comprises the expert reports used by the body in order to fulfil legal tasks even when the copyright to it belongs to some other entity. The problem of their later re-use is not subject to the regulations of the Act Access to Public Information and this fact cannot be grounds for denying access to public information" (WSA verdict of 4 February 2010, II SAB/Wa 155/09, lex No. 564558),

d) **Creating information**
   - "to treat a given piece of information as a public one, the decisive fact is not its creating, but rather the fact that this information was obtained and processed
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to fulfil public tasks" (NSA in Warsaw, verdict of 21 July 2011, I OSK 638/11, lex No. 1082790),

- "public information is every message created by broadly understood public authorities or persons discharging public functions, and also other subjects realizing this power or manage communal property or the property of the State Treasury in the scope of their authorisation" (WSA in Gliwice, verdict of 18 November 2010, IV SAB/Gi/59/10, lex No. 759205; cf. WSA in Poznań, verdict of 17 November 2010, IV SAB/Po 55/10, lex No. 759214; cf. WSA in Szczecin, verdict of 17 November 2010, II SAB/Sz 43/10, lex No. 756158),

- "public information should be construed as the contents of all the types of documents referring to, connected to, or concerning a public authority body. These are the contents of the documents directly created by the body, and also these which are used in the realization of the tasks predicted by the law (also these concerning it partially), even if they do not come directly from the body itself" (WSA in Warsaw, verdict of 18 May 2010, SAB/Wa 14/10, lex No. 674718),

- "a piece of information is of public information nature only when it is existing information, held by the body which is requested to provide access to it by the petitioner" (WSA in Cracow, verdict of 13 May 2010, II SAB/Kr 34/10, lex No. 674698),

- "not only the documents directly edited and created by the public administration bodies are construed to be public information, but also the documents which are used by the body to accomplish lawful tasks, e.g. supervisory or auditing" (NSA in Warsaw, verdict of 2 June 2011, I OSK 281/11, lex No. 990241),

- "Public information is every message created by or referring to broadly understood public authorities, or obtained or referred to other subjects discharging public functions in the scope of carrying out the tasks of public authority and managing communal assets or the property of the State Treasury. Public information concerns the factual sphere. Public information is the contents of the documents created by the public authority bodies, the contents of their statements and allegations, regardless of the target subject and the matter of concern. Public information is construed to be the contents of all kinds of documents referring to public authority bodies, connected to them, or in any way concerning the body, regardless of their subject. It is both, the contents of the documents that are directly obtained by the body, and also these used by the body in order to fulfil tasks provided by law, even if the information does not come directly from the body" (WSA in Warsaw, verdict of 5 April 2011, II SAB/Wa 77/11, lex No. 994279, also cf. WSA in Łódź, verdict of 20 December 2010, II SAB),

- "not only the documents created by the subject obliged to provide access to public information constitute public information, but also the documents cre-
ated by other subjects being at the disposal of the obliged one, even when they
are entitled to other rights, including copyright" (WSA in Rzeszów, verdict of
18 July 2011, II SAB/Rz 29/11, lex No. 853002),

– “public information is every message created by broadly understood public
authorities or persons discharging public functions, and also other subjects
realizing this power or manage communal property or the property of the
State Treasury in the scope of their authorisation" (WSA in Gliwice, verdict of
18 November 2010, IV SAB/Gl/59/10, lex No. 759205; cf. WSA in Poznań,
verdict of 17 November 2010, IV SAB/Po 55/10, lex No. 759214; cf. WSA in
Szczecin of 17 November 2010, II SAB/Sz 43/10, lex No. 756158),

– "public information should be construed as the contents of all types of doc-
uments referring, connected, or in any way concerning a public authority body.
These are the contents of the documents directly created by the body, and also
these which are used in the realization of the tasks predicted by the law (also
these concerning it partially), even if they do not come directly from the body it-
self” (WSA in Warsaw, verdict of 18 May 2010, SAB/Wa 14/10, lex No. 674718),

– "not only the documents directly edited and created by the public administra-
tion bodies are construed to be public information, but also the documents
which are used by the body to accomplish the lawful tasks, e.g. superviso-
ry or auditing" (NSA in Warsaw, verdict of 2 June 2011, I OSK 281/11, lex
No. 990241),

e) Public information and license agreements

– "in the scope of the access to public information act of 6 September 2001 there
are also civil-law contracts, including license agreements, signed by public
authority bodies and persons discharging public functions, when concern-
ing public matters. They constitute information created by a public authority
body. The access to it may be subject to limitations in the view of Art. 5 sec.
1 and 2 of the act" (WSA in Warsaw, verdict of 18 June 2009, II SAB/Wa
14/09, lex No. 563890).

The stand of the court interpretations, which show a clearly outlined jurisdiction
tendency, is accurately portrayed by the WSA in Warsaw verdict of 16 December
2011, where a broad reference to the above-presented issues was included. It was
noticed that "the legislator described the notion of public information in Art. 1 sec.
1 and Art. 6 of the u.d.i.p. In the view of the aforementioned regulations, public
information is every information concerning public matters, especially the matters
listed in Art. 6 of the act. For these formulations are not transparent, their inter-
pretation should be based on Art. 61 of the Constitution of the Republic of Poland,
according to which the right to information is a public right of a citizen, exercised by
the rules specified in an act. Therefore, it has to be accepted that public information
is every message created by or referring to broadly understood public authorities,
or created by or referred to other subjects discharging public functions in the scope of carrying out the tasks of public authority and managing communal assets or the property of the State Treasury. Public information concerns the factual sphere.”

The reference to Art. 6 sec. of u.d.i.p. when defining the term „public information” allows us to infer its broad semantic scope because of the use of the expression „especially”, which introduces an example catalogue of information subject to sharing. More information on this topic can be found in WSA in Warsaw verdict of 21 October 2010, which reads as follows „the regulation of the Art. 6 of the act of 2001 on the access to public information contains 34 items, and using the term „especially” by the legislator means that the catalogue in this regulation is not closed. Such a solution was accepted because in a democratic state of law, the as broad as possible catalogue of information should be subject to social control. The enumeration of the pieces of public information subject to sharing is only of demonstrational nature, which is pointed out by the expression „especially”. It allows to figure out which type of factual states a given notion refers to. In the case of receiving an application which raises doubts of the person responsible for allowing the access to information, one cannot be guided by the contents of Art. 6 of the act of 2001 on the access to public information” (file ref No. II SA/Wa 933/10, lex No. 755493).

The right to obtain information under Polish law is guaranteed already on a constitutional level which refers to this matter in several places. Art. 54 sec. 1 of the Constitution of Poland states that „the freedom to express opinions, to acquire and to disseminate information shall be ensured to everyone”. W. Szydło briefly summarizes this with the following: „this right used to be described as freedom of speech and print, but the expression in the Constitution is broader than that and more suitable for the development of mass media”. The jurisdiction in this area is abundant, but it concerns mostly the freedom of political debate and sharing of false information. From our point of view, mainly these rulings are of any importance, which directly refer to the freedom of acquiring information. A very important observation was made by NSA in Warsaw, verdict of 28 June 2005, noticing that „Article 54 of the Constitution of the Republic of Poland in sec. 1 regulates the freedom of acquiring information, which is of a broader scope in relation to the right to obtain information, discussed in Art. 61 of the Constitution. It is of no doubt that this freedom, especially important to mass media administrators and journalists, is a freedom to acquire information on one’s own initiative, and unlike in the right to information, other subjects are not obliged by law to provide information.”

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18 WSA verdict of 16 December 2011, II SAB/Wa 255/2011, LexPolonica No. 3885046
20 File ref. No. I OSK 1733/04, lex No. 179124.

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Sharing public information is also a significant issue under Art. 61 of the Constitution, which guarantees this right on a constitutional level. This right was shaped to be a civil right because it was granted not to „everybody”, but to a „citizen”. This article reads as follows:

1. A citizen shall have the right to obtain information on the activities of organs of public authority as well as persons discharging public functions. Such right shall also include receipt of information on the activities of self-governing economic or professional organs and other persons or organizational units relating to the field in which they perform the duties of public authorities and manage communal assets or property of the State Treasury.

2. The right to obtain information shall ensure access to documents and entry to sittings of collective organs of public authority formed by universal elections, with the opportunity to make sound and visual recordings.

3. Limitations upon the rights referred to in para. 1 and 2 above, may be imposed by statute solely to protect freedoms and rights of other persons and economic subjects, public order, security or important economic interests of the State.

On the basis of the provision above, it is worth to shed some light on the stand of Polish jurisprudence, which assumes that:

- "the legislator, formulating in Art. 61 of the Constitution the principle of "the right to information", at the same time he determined the rules of the interpretation of this right. For it is a constitutional right, the acts determining the mode of access to information should be interpreted in such way to ensure that the citizens, other persons and entities broadly entitled in this field, and all exceptions should be treated narrowly. This means using such rules of interpretation to these acts that are favourable for widening, and not narrowing down the disclosure obligation" (NSA in Warsaw, verdict of 21 July 2011, file ref. No. I OSK 678/11, lex No. 1082797),

- “according to Art. 1 [...] of the act [on the access to public information] as well as Art. 61 of the Constitution, it seems that the legislator intended to make the access to information as wide as possible, so considering the construction of Art. 1 of the access to public information act of 2001, it should be assumed that, in principle, public information shall be made accessible to the public according to the procedures and regulations provided for in the law. The subject which obtained the application for public information disclosure shall above
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all aspire to provide this piece of information" (WSA in Warsaw, sentence of 12 October 2010, file ref. No. II SA/Wa 933/10, lex No. 755493),

- "according to the access to public information act, in reference to Art. 61 of the Constitution of the Republic of Poland, it is not evident, neither expressly nor impliedly, that the provision of public information can assume a form of showing or examining the item created as the result of a contract signed by the public authorities" (NSA in Warsaw, sentence of 25 September 2008, I OSK 741/08, lex No. 516803),

- "the right to information concerning the activities of public authority organs is not of absolute nature, and in exceptional circumstances, the Constitution allows its limitations by virtue of the statute (Art. 61 sec. 3 of the Constitution), so the exceptions to the disclosure principle have to be evident from the statutory regulations, and cannot be introduced by a lower-level act, such as district statute" (WSA in Rzeszów, sentence of 7 November 2007, II SA/Rz 438/07, lex No. 340151),

- "information about current law is also public as it is information on the proceedings of public authority organs. Thus, it is within the subjective scope of this information as for the Art. 61 of the Constitution, or using the terminology of Art. 1 sec. 1 of the Act on access to public information of 6 September 2001 (Journal of Laws [Dz.U.] No. 112 Item 1198 as amended) it constitutes information on public matters. This type of information, however, does not include the polemics with the verdict, or the demand a statement of the law to be provided by the organ" (NSA in Warsaw, verdict of 24 January 2006, I OSK 928/05, lex No. 167166),

- "ratio legis of the regulations in Art. 61 of the Constitution of the Republic of Poland of 2 April 1997 (Journal of Laws [Dz.U.] of 1997 No. 78 Item 483), and also the Act on access to public information of 6 September 2001 (Journal of Laws [Dz.U.] No. 112 Item 1198 as amended) is evident from the rule of participation of the citizens in public life, and holding public control. In order to fulfil this task, a citizen is entitled to acquire knowledge about public matters" (WSA in Warsaw, sentence of 31 May 2004, file ref. No. OSK 205/04, lex No. 158987),

- "in the light of the Art. 61 of the Constitution of the Republic of Poland, the right to information is a public right of a citizen, which is exercised by the rules specified in the Act on access to public information. Hence, the right to information is a principle, and the exceptions to it should be precisely interpreted. This is why Art. 156 of Penal Processual Code cannot be used broadly" (NSA in Warsaw, sentence of & March 2003, file ref. No. II SA 3572/02, lex No. 144641),

- "before the Act access to public information of 6 September 2001 came into force (Journal of Laws [Dz.U.] No. 112 Item 1198), the regulation of
Art. 61 sec. 2 of the Constitution of the Republic of Poland could be an independent basis for the request for the receipt of information on the activities of the district organs" (NSA in Warsaw, sentence of 30 January 2002, file ref. No. II SA 717/01, Wokanda 2002/7-8/68),

- "Art. 1 sec 2 of the Constitution of the Republic of Poland states the obligation of provision of existing information (documents). While no regulation obliges the state and self-government organs to create, exclusively for the needs of the press, any lists, registers, nor other types of processed data" (NSA in Warsaw, sentence of 24 June 1999, file ref. No. II SA 686/99, lex No. 46190).
Chapter II. Data, information, knowledge – commercialization of knowledge vs. open access movement

1. The sector of information

An introductory discussion of legal nature deserves to spend a few words on the broadly understood relation between data, information and knowledge. Such deliberations would seem trivial, if it were not for the commercialization of information progressing ever faster, as noticed and described by the American economist F. Machlup already in the 1960’s. This researcher analysed traditional sectors of the economy, especially discussed the role of information in the production process. Supported by his own research that showed a paramount influence of information activity on the GNP, he developed the notion of the so-called “knowledge industry”, which had become a new sector of the economy. These theories were further developed in the fields of social science by D. Bell, and economic sciences by M.U. Porat, who introduced notions such as “the theory of post-industrial society” or “primary and secondary information sector”. As noted by B. Ney “in modern society (and state), a triad of three notions plays a very important role in the functioning and the development of the society: information, knowledge, and wisdom”. The author, mentioning wisdom, means the ability to use (utilize) knowledge in both an individual and also a collective approach. In the latter example in literature, it is assumed that public administration with the ability to properly use the information is described as a wise, or a good one.

The sector of information steadily develops because of the input of modern technologies, including the telematics, applicable both in the economy, as well as in the daily life, influencing the so called “the virtualization of institutions,
markets, and broadly understood business”.

Bell wrote that the economy based on the production of material goods has to be replaced by the economy based on the production of knowledge. This economy would fulfil the model based on production, distribution, and consumption of information, using computers and telecommunication on a large scale. Z. Dobrowolski expressed his opinion that this approach to the commercialization of knowledge is in contradiction to the free access to it, which, for some people, constitutes the basis for democracy. Bell, in proposing paid access to information, seems to suggest limiting its availability. In fact, according to Z. Dobrowolski, Bell was keen on adding information to the market, commercializing it, and centralizing its production. M. Poster expressed his opinion that the commercialisation of information gains on significance when the popularization of the means of mass communication and computers allows for fast, common, and inexpensive access to information. As it is aptly noticed by Z. Dobrowolski, the commercialization of information “proceeds with great resistance, giving the examples of the Internet and successful Open Source movement. [...] The development of computer networks in developed countries not only caused the emergence of information elite in the form proposed by Bell, but also provided a universal access to information. The concept of paying for the access to information met stronger opposition than expected. The industrialization of information relies on the production of information and knowledge for profit”.

The importance of the commercialization of information is emphasised in a well-known Umberto Eco-slogan “Information is Power”, explained by M. Muraszkiewicz as the information that gives strength or information that gives authority. The author points out the partly misleading overtone of this quote, as it, in fact, boils down to the statement that it is not the possession of information that gives power, but rather monopolizing and restricting the access to it. The experts on strategic planning create so called business ecosystems which constitute a network of connections between the businesses, and their clients, suppliers, con-

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5 Cf. J. Czochański, GIS w rozwoju serwisów informacyjnych i dostępności IT dla administracji, elektroniczna Administracja, No. 7-6, 2006, p. 7-8.
7 M. Poster, The Mode of Information. Post structuralism and Social Context, Chicago 1990, p. 179
8 Z. Dobrowolski, Koncepcja…
sumers, and competition. One of the main factor of business ecosystems is a well-organized system of databases, which is a set of processed information taking part in the creation of a community, for example economic, cultural, or educational.\textsuperscript{10}

One of the myths of the information society is the assumption that the availability of information and the speed of processing it directly leads to the development of knowledge. This myth is successfully debunked by Z. Dobrowolski, who treats information as raw material used to construct knowledge, which unlike information becomes a basic good consumed by the information society. The author notices an incredibly significant relation of information and knowledge, which in essence is that the analysis and choice of information is based on knowledge. This is why the latter is of significantly higher value.

\textbf{2. The notion of information}

Some researchers claim that information, as a primitive notion used for describing other notions does not require a definition. It is alleged that this notion is as general as the notions of time, energy, gravity, movement, or life. As observed by K. Materska, the notion of information was a subject of description of the following research methods: quantitative, qualitative, systemic, philosophical, historical, psychological, sociological, communicational, infological, or functional. Each field is characterized by assuming an individual way of describing a given term. Not to aspire to create a list of all definitions of information elaborated by individual fields of knowledge, it is worth mentioning some of the properties of information, which independent of the method of description are always valid, and translate to the description of information in the language of the law. A multicontextual analysis of the notion of information allows alleging\textsuperscript{11} that:

1) information is of immaterial nature, deprived of form or matter, in order to record it, one needs a carrier,
2) information as such does not have a designate of its notion, it fulfills a descriptive form for other notions,
3) it is objective and independent from the recipient and their subjective receipt (it depicts the reality, process, state, situation, or even a legal norm),
4) as long as information is objective, its usability may be evaluated subjectively,
5) it is synergetic (a sum of two pieces of information gives a bigger result from the sum itself),

\textsuperscript{11} See also D. Felcenloben, Geoinformacja. Wprowadzenie do systemów organizacji danych i wiedzy, Katowice 2011, p. 27-29.
6) cannot be worn out (but can be deformed),
7) usually, it is indivisible,
8) cannot be used up (the same piece of information can be used multiple times without losing it),
9) it is copyable, and mobile,
10) it is subject to processing, resulting in new information, without losing the old one,
11) quickly reaches the recipients,
12) may be costly when it comes to obtaining it, the processes of creation are much more expensive than the processes of its reproduction.

It is worth noticing that many of the features (more or less intensely) from above may also be found in a work of authorship (a work which benefits from copyright protection), which in fact can incorporate information. It leads to the conclusion that the notions of information and a work of authorship intersect. In principle, a work can be a set of more or less creatively edited pieces of information. The relation between these two notions will be referred to later. Especially, it has to be pointed out that the notions of information and of a work of authorship do not fall under the same regime, considering the fact that the legal regulations concerning the access to information and a permitted use of copyrighted works are not correlated and have raised many doubts about the rules of sharing information embodied in a work of authorship. It makes the rules of using the information contained in copyrighted items often unclear, so that they need to be specified more precisely by determining their objective scope of normalizing the individual provisions and mutual relation between these norms.

The literature stresses that the information created for the needs of the information society should meet the following conditions:

1) measurability,
2) authenticity, credibility,
3) relevance,
4) specificity (maintaining the adaptation of a given type of information to the subjective needs of the recipient),
5) completeness,
6) communicability,
7) usefulness,
8) efficiently causing increase of knowledge about a given topic.

The significance of information in modern society cannot be overrated, especially when it is served in a well-edited form of data bases. In such eventuality, pieces of information (data) enter in a synergetic process with other pieces available in the base. Data, contrary to information, constitutes a set of characters, which depict factual and legal situations. They may be of any structure, type or
form e.g. language expressions, symbolic expressions, mathematical expressions or signals.\(^{12}\) Just defining mutual relations between data or its interpretation constitutes information.\(^{13}\) The need for establishing rules for access to information can be described be the function of the information. Information primarily fulfils an informative and knowledge-creating function. This means that, while information provides data on the topic researched by the recipient, it also interacts with information possessed by the recipient, contributing to the creation of knowledge. Broadly understood information also fulfils the following functions: communicative (the participation of a person in social life), recreational (creating opportunity for fun and relaxation), cultural (sharing values and traditions), and educational. From the point of view of the analysis of the laws regulating the access to information, it is worth mentioning that a piece of information is especially valuable and important when its kind and quality begins to fulfil a decision-making, and controlling function. A situation like that may appear when information helps a person make a proper decision or aim to induce that person to behave in a certain way.

### 3. The notion of knowledge

According to a dictionary definition of knowledge this is: “all information gained in the process of learning; a store of information on a given field, branch of science”.\(^{14}\) The deliberations about the broadly understood notion of knowledge led to the development of many approaches to this issue, allowing numerous typologies and knowledge classifications. One of the encyclopaedic approaches allows us to distinguish knowledge in a narrower and a broader sense. The narrower meaning embraces the whole of credible pieces of information about the reality together with the ability of using them. In this sense, it is mostly scientific knowledge described in the cognitive theories and the philosophy of science. In the broader sense, knowledge is every store of information and beliefs, which are being ascribed a cognitive and practical value.\(^{15}\) In practice, the notions of knowledge and information are erroneously equated. The difference between these two notions becomes more evident when one takes into consideration the division of

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\(^{13}\) D. Felcenloben, Geoinformacja..., p. 11.


the notions in the literature, which allows us to single out four phases in processing knowledge. These four phases interpenetrate in a following way: data → information → knowledge → wisdom. As it is evident from this assumption, data are the basic unit of information, and knowledge is an interpreted information. Sometimes information is described as objective knowledge, which is differentiated from knowledge per se in such way that the latter is called the subjective one. Collating these two terms, it cannot be overseen that information is of static nature, it is independent from a person (owner), and in principle, it is overt, while knowledge is dynamic, dependent on the person (owner) and hidden.

According to D. Felcenloben knowledge is nothing else as capacity of interpreting data and explaining the reasons why certain events occur. The literature commonly values the importance of knowledge in the economy. It is even claimed that knowledge is the new capital in the electronic economy. K. Materska notices that “the access to the network (knowledge in network, networked knowledge) may be a key condition of the success of companies and research teams. The companies’ knowledge, being gradually more networked with the knowledge of other subjects, creates a profitable situation for all connected organizations, for as an item shared over the network, this knowledge is much more powerful than hidden or isolated one. It does not mean, however that the network users can forget about a very careful border between the knowledge that can be shared for the sake of cooperation, and the strategic knowledge, being a source of competitive advantage”.

4. The commercialization of knowledge

In the light of the discussion above, especially about the differentiation between the notions of information and knowledge, it has to be pointed out that there is one case where these two notions are being treated equally. The notion of “information” may be used interchangeably with the notion of “knowledge that performs the storage function”. It is justified by the assumption that tacit knowledge is not “codifiable”, while the codified knowledge, so called explicit knowledge, is in fact information. In this approach, knowledge is subject to classification as for the possibility for its protection and the means of it. There have been a number of attempts on categorizing knowledge in this aspect, and some of them are worth describing before proceeding to the deliberations of strictly legal nature.

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17 K. Materska, Informacja w organizacjach społeczeństwa wiedzy, Warszawa 2007, p. 47.
18 D. Felcenloben, Geoinformacja..., p. 12.
19 K. Materska, Informacja..., p. 179.
According to T. Stewart’s concept, knowledge may be divided into:
1) worker’s knowledge (experience, skills),
2) knowledge recorded in documents,
3) knowledge which may be protected by the means of the rights to intellec-
tual property or other, for example business secrets.  

An attempt on merging the academic achievements in the field of information
and knowledge to legal institutions of their protection was made by W. Kotarba,
who classified the above depicted understanding of knowledge (in sense of infor-
mation) according to legal remedies. A general scheme presented by the author:

![Diagram of protected knowledge, protected explicit knowledge, and classified knowledge.]

**Figure 1.** W. Kotarba (ed.), Ochrona wiedzy a kapitał intelektualny organizacji,
Warszawa 2006, p. 89. W. Kotarba’s approach

The author, by using the term “protected knowledge”, includes “protected explicit
knowledge”, “classified knowledge”, and knowledge belonging to these two groups
simultaneously. Protected explicit knowledge is such that it is revealed in a great
scope, but it is also enjoys legal protection. This protection is granted to a specified
subject of matter, for a limited period of time, and on a specified territory, because
of this, despite its common availability for others, it may be used on legal basis only.
Commercial use of this knowledge requires the consent of the owner of intellectual
property rights. Protected explicit knowledge is protected by the copyright law and
industrial property law. The subject matter of the protection are such immaterial goods
as: works of authorship, inventions, utility models, industrial designs, and the topogra-
phy of integrated circuits, plant species, improvement projects, geographic mark-ups,
and trademarks. The scope of protected explicit knowledge may include also rights to
a business name of an entrepreneur. Classified knowledge, according to the author,
is understood as information never released to the public. This knowledge divides
into internal and general. Internal knowledge is understood as information which has
been classified by the organization. As an example, W. Kotarba proposes know-how

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and official secrets. General knowledge in this aspect means knowledge protected by the law according to such acts as: protection of personal information act or protection of classified information act. The author notices that some kinds of information will gain protection of both, explicit, and classified character, producing the examples of knowledge protected by both, a patent and know-how. A detailed aspect of the above observations are collated as follows:

- **Free**
- **Protected**
  - confidential or tacit
  - hidden
  - internal: Know-how
  - Official secrets
  - General: Personal data
  - State secrets

- registration and research
  - inventions
  - utility models
  - new plant species
  - improvement projects
- registration no research
  - industrial design
  - chip topography
- no registration
  - works
  - computer software
  - organization knowledge carriers
    - trade marks
    - trade names
    - geographical indications

**Figure 2.** W. Kotarba (red.), Ochrona wiedzy..., p. 90. W. Kotarba’s approach
5. Spatial information and free software

The depicted above capacity of knowledge and information to generate profit is not exploited utterly, as some of databases rely on open software, open data and open licences. Spatial information, similarly to literature or art, has to face the alternative of joining the open access movement. Therefore, as noticed by J. Michalak this is important to sort out the basic notions related to open source, which are used along with spatial information issues. These notions are such as open software, free software, open of free geodata, closed or enslaved software or geodata. We accept the author's stand that the term „free software” comprises within its scope the term „open software”, nevertheless we decide to use these two notions interchangeably.\(^{21}\) It shall be noted though that in official documents these two frequently used terms are jointly referred to as FLOSS (eng. Free Libre/Open Source Software).\(^{22}\)

The grounds underlying making works of authorship available under open licences are multitude.\(^{23}\) Open licences, as opposed to commercial licences, are used more and more frequently by the authors who wish to disseminate the result of their creative activity in largest possible scope and with no limits. As for special information, the most noticeable reason underlying this choice is a footloose performance of public interests and aims. Creating an infrastructure of public information is far and away easier when relying on software, which is available at no cost, and which terms of use and share are uncomplicated.\(^{24}\)

However this is important to note that there are many reasons that keep open software developing. J. Michalak ranked open software under headings of motivation underlying its development and sorted it out into:
1) freeware (authors are most of the time amateurs working separately)
2) public software, public domain (pol. publiczne oprogramowanie, własność społeczna)

As for public software it is usually financed from a budget of a country. That's also why it is commonly claimed that every citizen shall gain free access to it. This does not always become to be a general rule across many countries. When the State's Treasury finances the project, it also becomes the owner of it, but data is

\(^{21}\) J. Michalak, Otwarte oprogramowanie i otwarte dane w geamatyce, Roczniki Geomatyki 2007, No. 2, p. 12.
\(^{23}\) L. Litwin, G. Myrda, Systemy Informacji Geograficznej. Zarządzanie danymi przestrzennymi w GIS, SIP, SIT, LIS, Gliwice 2005, p. 239.
\(^{24}\) J. Michalak, Otwarte oprogramowanie..., p. 15.
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made available most of the time under commercial licences and at a cost.\(^{25}\) Spatial information data bases may be developed in a twofold way: 1) based on commercial software, 2) based on open software.

In general, it is worth mentioning that commercial software used in creating maps are Internet Map Server developed by ESRI, Geomedia Web Map developed by Intergraph and Map Guide developed by Autodesk. However, in the literature immense importance of open software is being stressed. It is emphasized that open software shall keep on developing, and its use shall be considered by the public sector in the course of maps’ creation.

As for use and share of open software, the most frequently used licence is GNU General Public Licence. The terms of use of the licence make it possible to share the work later at charge or without it. As it comes to Poland A. Iwaniak and A. Śliwiński wrote in 2007 that “in Poland relying on free software when developing operational systems GIS and SDI is not popular yet. At the same time the free software is prospering well in West Europe and US. [...] UMN MapServer, GeoServer, GeoNetwork, uDi or Grass are programmes gladly and willingly used not only due to free software terms of use but also because of its accordance with standards of Open Geospatial Consortium (OGC)”.\(^{26}\) Therefore this is plain to see that infrastructure of spatial information may be developed basing on both: commercial and open licences, and may be made available on both: commercial and open licences too.\(^{27}\) J. Michalak noticed some time ago that “in many countries one may observe a strong pressure of society concerning making data available which refers to a natural environment and digital maps prepared for tourist purposes”.\(^{28}\) This is commonly also claimed in the society that if data refers to private real estate, the access to that date shall be free for the real estate’s owner. This idea was shedding a light on such projects as:

1) OpenStreetMap,
2) Public Geo Data,
3) Open Source Geospatial Foundation.

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\(^{25}\) J. Michalak, Otwarte oprogramowanie..., p. 11.


\(^{27}\) A. Iwaniak, A. Śliwiński, Implementacja..., p. 50.

\(^{28}\) J. Michalak, Otwarte oprogramowanie..., p. 14.
Chapter III. The right to geoinformation in the information society

1. Information society – overview of approaches

The right to geoinformation can be considered to be a new legal right of an individual to meet the new information needs of an information society. It is worth emphasising that despite an individual’s right to information, accessing spatial information is frequently not referred to in such laws and regulations such as the acts on the infrastructure for spatial information or the copyright law which are subject to separate analysis in this book.

B. Ney notices that: “information society means that common information on all fields of knowledge which interests general public is easily accessible, while the specialized information on specific topics which concerns professionals is generated and made available to the people interested in it by specialized authorities which take into consideration all the legal limitations which protect certain public interests. As the information society develops, some kinds of information, which used to be specialized, become common information. This process does not mean that the value of information decreases, but it is rather typical of a higher level of civilization”.

The analysis of the geoinformation content and the rules of access cannot take place without accounting for the essence of the information society which imposes new standards of behaviour and makes its members expect new things in the field of information access, including accessing the geospatial information. Therefore, the analysis of the right to geoinformation would be incomplete without introducing and describing the principles of the idea which has become a doctrine of modern world and pervades all fields of life, also becoming a part of the legal language. This phenomenon was accurately described by Z. Dobrowolski: “the information and knowledge gave name to social theories which aim to characterize the moving border of modernity”.

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An attempt on defining the term “information society” shows that it is a popular slogan, which can take many meanings and is thought to be of several provenances. The multitude of meanings, contexts and fields where this term can be used encourages to simplify the tedious search for the exact semantic field and to assume that “the information society” characterizes the arrangement of relationships based on the information economy. F. Webster enumerates five groups of defining the information society. The groups were established according to various criteria. The definitional perspectives may be as follows: 1) technological (emphasise the development of the information technology), 2) economic (based on knowledge and information), 3) vocational (based on defining production and work), 4) spatial (national perspective), 5) cultural (based on the assumption that the modern culture is a virtual reality). Also, it is not entirely certain where the beginnings of the information society era go down to. M. Luterek postulates that the literature sets the origins of the information society on such events as the invention of the first computer, the creation of a computer network or the dominance of the economy by the service sector. However, there are authors which cast doubt on the fact that such era has come at all. As an example, M. Luterek proposes that the term “information society” is being used too soon, instead he coins a more accurate term: “a highly informatized society”. This author, assuming that an agricultural society is based on the independence from hunting and gathering, and an industrial society is independent from farming, claims that the notion of the information society means the independence from fossil fuels. He points out, that presently fuel prices and the access to oil are the major factors influencing the economy. An information society will only come into existence when information takes the function of fossil fuels in economy. Eventually, it means becoming independent from non renewable resources. All we know is that a new era requires new means of gathering, selection (evaluation), processing, generating, sending,

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3 Seeking the sources of the idea of the information society, we can find out that this term was first coined in Japan. There are several backstories of the origins of this expression. According to one of them, the term was first used by K. Kurokawa and T. Umesao during a conversation in 1961 (Japanese: joho shakai, johoka shakai). Consequently, in the 1960 the Japanese equivalent of this term started to appear in the titles of local studies. Cf. L. Z. Karvalics, Information Society – what is it exactly? (The meaning, history and conceptual framework of an expression), Budapest 2007, p. 5, also available at http://www.gesci.org/assets/files/Knowledge%20Centre/Information-Society-what-is.pdf, as of 22 January 2014.

4 Cf. F. Webster, Theories of Information Society. The International Library of Sociology, 2002.

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and using huge amounts of information.” W. Babik writes that the era of the information society should be characterized by being open, allowing to find quick and relatively cheap information, constant education, and increasing work output.

The changes in information technology make the discussion about the shape of society a very broad one, and in consequence the term “information society” has many analogous variations which are made up to fit into the views of authors who create separate, but linked together concepts which are frequently compared with each other. The fact that the notions come from different fields, makes the language of their description not uniform, and the definitions imprecise. Because of this, J. Bierówka et.al aptly assumes that the information society is a “simplified model of reality”. The author also notices that: “the occurrence of fundamental transformations of civilization is possible largely due to the great development in the field of gathering, processing, and transmitting information. This process, of course, is as old as the history of society, but only in the second half of the XX century, influenced by the development of the media and the democratization of the society, it gained a new dimension, thanks to the commodification and popularization of information”. Such phenomena as “the demassification of the mass media” or “the domestication of the Internet” played a great role in this process. A. Toffler, who first coined the term, described and named the phenomenon known as the individuation of the needs of the individuals manifesting itself by seeking for concrete and specialized piece of information in newspapers, radio, and television. Since 1950’s a decrease in the high-circulation newspapers has been noted, on the other hand, specialized mini-magazines dedicated to a specific reader have gained in popularity. It makes the publishers reconsider the press as mass media, taking into consideration the scope of individual newspapers. Toffler argues that new forms of audiocommunication have caused the drop of the radio listening rates in The United States from 4,8 hours daily in 1967 to 2,8 hours in 1977. A similar process is taking place in the audiovisual industry, which now enters the “smart TV” stage. If one adds to it mobile communications and the domestication of the Internet, the result is a new era of civilization delivering many goods which become more accessible and universal. There are many other

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6 Cf. W. Babik, Informacja i jej zagrożenia w społeczeństwie informacyjnym, a speech given at the AGH University of Science and Technology in Kraków, 9 November 2002.
7 J. Bierówka, Zasada wzajemności w społeczeństwie informacyjnym, Kraków 2009, p. 83.
8 J. Bierówka, Zasada..., p. 82.
10 The notion of „smart TV” has been used more and more recently, but in fact it was already used in 1980’s where the scientific magazines were a ground of real discussion on the possibilities of broadening the scope of services available on the TV. Cf. J. Free, Computerized superfidelity digital TV, Popular science, July 1982, p. 61.

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expressions accompanying the term “information society”, such as: 1) electronic era, information era (McLuhan), 2) knowledge society (Drucker), 3) technotronic society (Brzeziński), 4) the third wave (Toffler), 5) telematic society (Martin), 6) cybernetic society, 7) global information society, and 8) the age of information.

The literature commonly names ten traits of the information society, drawn up by P. Sienkiewicz. These are:
1) the dominance of the service sector in the social employment structure with the constant development (qualitative and quantitative) of the IT services,
2) high pace of the development of the social communication network and the modernization of the information structure,
3) the high importance of the information resources of organizations as the strategic resources,
4) education and scientific research as the main source of innovation and civilization progress,
5) the appearance of a “new economy” in the result of the interaction of technology (mainly IT), economy and society,
6) information security as an important element of a society (in the field of defence, the concepts of “Information Warfare” and “Cyberwar”),
7) a huge impact of intellectual property and electronic media on the change of social behaviours, (“Cyberculture” phenomenon),
8) organizational integration of IT, communication, and mass communication systems (electronic media),
9) the globalization of information systems (the phenomenon of the Internet) as a factor of economic globalization,
10) emerging of new types of organizations (“virtual organization”, “network organization”, “knowledge organization”) and their ways of management.11

The definition proposed by T. Goban-Klas and P. Sienkiewicz is also worth mentioning. They describe the information society as “a society which not only has highly developed means of processing information and communication, but also information processing is a basis for creating national income and provides means of living to the majority of the society”.12

2. Information society – legal approach

The notion of information society has not been yet precisely defined at the level of the language of the law, although it appears in a number of normative acts.

11 Cf. J. Bierówka, Zasada..., p. 84.
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An analysis of these legal acts enables us to reach at least partial understanding of this notion in the context of legal rights provided for individuals, including e.g. ensuring personal data protection, the right to privacy or acquired rights to intellectual property. On the one hand, the information society is based on information, but on the other it cannot be overseen that the access to the information is regulated or restricted. One of the first legal acts using this term was the Directive 2000/31/WE of 8 June 2000 of the EU Parliament and of the Council on certain legal aspects of information society services, in particular electronic commerce, in the Internal Market, which significantly contributed to the popularization of this term in the language of the law and the legal language.

The need for creating general and flexible legal boundaries on the level of the EC for supporting the information society in Europe was already addressed by the European Council during the meeting in Corfu on 24-25 June 1994. It was noted that “the presently happening unprecedented technological revolution in the era of information opens new ways of great economic development, employment, but also becomes the main challenge. [...] Both European Council and European Commission stated that the Community and its member countries play an important role in supporting this development by giving a political incentive creating clear and stable regulatory framework (especially concerning market access, computer network concord, intellectual property laws, copyright and data protection)”.

The European Council also emphasized the philosophical and cultural aspects of the information society. It was also pointed out, that in the light of legal regulations of the information society, a lot of attention should be directed to the services that characterize it and have impact on the quality of life and the way of conducting economic activities.

The term information society was used in the Council resolution of 19 January 1999 on the Consumer Dimension in the Information Society. In this legal act, it is noticed that:

1) the progressing development of new technologies of transmission and gathering information leads to introducing some organizational, commerce, technological, and legal innovations, which have a great impact on the general society,

2) new communication technologies will be significantly influential on the daily life of all citizens despite the fact whether they participate in the innovation or not,
3) new information and communication technologies and the accompanying de-
velopment of the information society offers many potential benefits for the
consumers and creates new, never known before, commercial possibilities,
which may expose the consumers’ interests to a threat.

The importance of the relation between the notions of the information and
the consumer was also pointed out. It was assumed that in an information society,
the consumer is particularly interested in preserving the information transpar-
ency over its quality and quantity (including commercial information), and the
access to the information technology being a tool for acquiring knowledge and
education. At the same time, it was stressed out that the universal availability of
information cannot violate the consumer’s personal information including their
health, security, and privacy.

3. The services of an information society

Had it not been for the information society’s services, the notion of the in-
formation society would not be so significant. The examples of the information
society’s services include: telecommuting, e-learning, linking systems of different
universities and science centres, broadly understood telematic services used by
small and medium companies (including GIS), using intelligent solutions for traf-
fic management, services included in the introducing of IT systems in the health
service (e.g. electronic medical record), e-commerce services available in the pub-
lic sector (include such services as: 1) eSourcing, 2) eProcurement, 3) ePayment),
services available in the city information highways. The definition of the informa-
tion society was then introduced in the art. 1 p. 2 of the Directive 98/34/WE of the
European Parliament and of the Council of 22 June 1998 laying down a procedure
for the provision of information in the field of technical standards and regulations
concerning the information society. Thus, an information society’s service is such
a service which simultaneously shows four characteristics:
1) is provided for the consideration,
2) remotely,
3) electronically,
4) on the individual demand of the service recipient.

Paragraph 18 of the preamble to the electronic commerce directive highlights
that “the services of the information society include a wide variety of on-line busi-
ness activities; such activities may especially consist in selling goods on-line; such
activities as delivery as such or off-line services are not part of these services; the
services of the information society are only not limited to the services which ena-
ble concluding a contract on-line, but also some services which are not paid by the
content recipients, as long as these are business activities; such services comprise
offering on-line information or commercial information or providing a tool for searching, accessing, and acquiring data; the services of the information society also include transmitting information over the communication network, providing access to communication network or hosting information sent by the client”.

The report of the European Commission of 2004 points out that from the point of view of the Member States of the European Union we can enumerate 12 public services for citizens (government to citizens, G2C) and 8 public services for entrepreneurs (government to business, G2B), all of them provided within the infrastructure of the spatial data.16

Public services important to the citizens concern e.g.:
1. personal income tax of natural persons,
2. employment exchange,
3. social insurance,
4. proofs of identity,
5. vehicle registration,
6. building permits,
7. reporting to the police,
8. using public libraries,
9. martial status acts,
10. university applications,
11. change of address,
12. health.

Public services important to an entrepreneur concern e.g.:
1. Social Insurance Company payments,
2. registration of business activity,
3. corporate income tax,
4. VAT,
5. sending statistic data,
6. bills of entry,
7. fees for using the natural environment,
8. public procurements.

The importance of the spatial information in the information society can be also easily depicted by non-exclusive listing some of the fields this information is applicable to:

1) geodesy,
2) spatial planning,
3) geography,
4) meteorology,
5) geology,
6) archeology,
7) environmental protection,
8) forestry and agricultural economy,
9) public security,
10) statistics and demography,
11) tourism,
12) banking,
13) transactions in real estate,
14) telecommunication,
15) commerce,
16) mining,
17) power industry,
18) industry
19) plumbing services,
20) transport,
21) communication,
22) health care,
23) fighting crime,
24) management and marketing
25) foreign affairs,
26) many more.\(^\text{17}\)

### 4. Geoinformation society

The term “geoinformation society” has been coined by J. Gaździcki, who uses this notion to denote a society, which largely uses the geoinformation accessed by generally available services of geoinformation infrastructure (infrastructure of geospatial data). The scope of geodata used by an average user is growing every year. The user’s consciousness of the need to access to the geoinformation is also

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rising. A survey conducted in 2006 and in the beginning of 2007 encountered the change of attitude of users to geoinformation comparing to 2004. One of the recent surveys conducted from January to May 2009 gave a new light on the issue of the use of geoinformation. The survey has been answered by 290 respondents, among which 158 were women and 132 were men, aged between 20 – 50. The results were very interesting. For example, when people were asked about the frequency of using geodata 34% of them said they would use it everyday, 36% of the would use it a few times a week and 23% a few times a month. The reason for accessing a geo-database would be educational (174 respondents), individual like going on a holiday trip or purchasing a real estate (154 respondents), professional (118 respondents), curiosity (104 respondents), a need to gain information about the surrounding world (102 respondents), scholar research (34 respondents). It is noticeable that an individual need comes before professional one. This is one of the features of the day to day society, which more and more deserves to be denoted as geoinformational one.

This is important to note however that geoinformation “flow” does not only refer to the members of the society themselves, but it affects also public and private sector. For instance organs of administration control an individual and perform their legal obligations through geoinformation.

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Chapter IV. Geoinformation in UE regulations – the INSPIRE directive

1. Introduction

The global geo-observation systems produced tremendous numbers of spatially dependant data sets in the last decades. They require a standardized Spatial Data Infrastructure (SDI) i.e. regularization for the technologies and policies of sharing geospatial data throughout all levels of government, the private and non-profit sectors, and the academic communities. The aim of regularization is clear: 1) to share data evaluation and eliminate duplicated efforts in data evaluation; 2) to render geographic data worldwide easily accessible; 3) to support a seamless integration of geographic data from different sources.¹

The US Geographic Data Committee was one of the first bodies that have been legally mandated to set up a national Spatial Data Infrastructure². The Executive Order contains (in my opinion the most correct) definitions of SDI, Geospatial Data, Geospatial Data Clearing House:

(a) ‘National Spatial Data Infrastructure” (“NSDI”) means the technology, policies, standards, and human resources necessary to acquire, process, store, distribute, and improve utilization of geospatial data.

(b) ‘Geospatial data” means information that identifies the geographic location and characteristics of natural or constructed features and boundaries on the earth. This information may be derived from, among other things, remote sensing, mapping, and surveying technologies. Statistical data may be included in this definition at the discretion of the collecting agency.

(c) The “National Geospatial Data Clearinghouse” means a distributed network of geospatial data producers, managers, and users linked electronically.


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Throughout Europe there have been a number of national and regional initiatives to establish Spatial Data Infrastructures, most of them driven by public administration or by public-private partnerships. Prominent examples include: 1) Nomenclature des unités territoriales statistiques (NUTS), 2) Arrangements on European Map Projections, 3) Draft Arrangements on an European Vertical Reference Systems, 4) Draft Arrangements on an European Reference Grid, 5) IMAGE 2000 and CORINE Landcover 2000, 6) European Soil Atlas, 7) Euro-BoundaryMap, 8) Euro-Regional Map.

Unfortunately, spatial information in Europe can be described as fragmentations of datasets and sources, with gaps in availability, lack of interoperability or harmonization between datasets at different geographical scales and duplication of information collection. Therefore SDI initiatives in Europe lacked a coherent, Europe-wide framework on which standards should be used, and more importantly, what type of feature models (i.e. for example attribute names, common spatial reference models, etc.) should be followed. The multilingual nature of the European Union increases further this complexity. However, awareness has grown at national and at EU level about the need for quality geo-referenced information to support our understanding of the complexity and interactions between human activities and environmental pressures and impacts. Initiatives to establish a European Spatial Data Infrastructure are therefore timely and relevant but do also face major challenges given the general situation outlined above and the many stakeholder interests to be addressed.

Thanks to this awareness, in September 2001 an E-ESDI Expert group, representing geoinformation experts of the European Commission, the European Environmental Agency, and Member States’ environmental and national mapping bodies started the elaboration of a proposal for a European directive to establish a European Spatial Data Infrastructure (ESDI). The adoption of the proposal for a directive on establishing an Infrastructure for Spatial Information in the European Community by the European Commission in July 2004 marked the first important step on the way to a European-wide legislative framework to achieve a European Spatial Data Infrastructure. (INSPIRE Directive 2007/2/EC). The Directive ensures the compatibility with adaptation of common Implementing Rules (IR) in specific areas as Metadata, Data Specifications, Network Services, Data and Service Sharing, Monitoring and Reporting.4

2. Ground of INSPIRE – ISO 19100

The spatial electronic data are produced by geo surveying instruments during in-situ measuring processes or by monitoring systems as continuous data flow or by digitizing a graphical map or by simply keying in observation records to a computer. The data are stored in some *coded digital form* on the producing equipment then, usually after some pre-processing, transferred to dedicated storing devices. Unfortunately, there are several forms used in geo-observation equipments and several types of spatial data in the different geo-disciplines. The ground condition of interoperability is an inter-disciplinary valid *unified form of the geographic location* and *unified forms for each type of spatial data* elaborated separately by the relevant geo-discipline. Beside this condition a *catalogue system* and an open *data distribution system* are necessary for the effective data sharing at national, regional or global level.

The regional and global services like meteorology realized at first the necessity of these conditions. The FM-94 BUFR (Binary Universal Form for data Representation) was the first – and even today used – unified data format designed for meteorological and oceanographic data.\(^5\)

The ISO 19100 Geographic information/Geomatics Standard series elaborated by ISO Technical Committee (TC) 211 had a larger perspective with the intention to cover every branch of geo-disciplines. This series has been based on the proposals of Open Geospatial Consortium (OGC), World Wide Web Consortium (W3C), Object Management Group (OMG), Organization for the Advancement of Structured Information Standards (OASIS).\(^6\) The standardization was started at 2001 and still is in process. The already elaborated standards are enlisted in Appendix 1.

The technical round of INSPIRE is based on this standard series, therefore it deserves a closer look. It is an integration of the concept of geographic information with that of information technology producing standards for the next areas: 1) *Infrastructure for geospatial standardization*; 2) *Data models for geographic information*; 3) *Geographic data management*; 4) *Geographic information services*; 5) *Encoding of geographic information*; 6) *Specific thematic areas – Imagery* (Fig.1).\(^7\)


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Figure 1. Integration of geographic information and information technology into ISO 19100

1) Infrastructure Standards ISO 19101, 19103-106 were developed in order to provide an infrastructure for the further standardization of geographic information. ISO 19101 describes a Reference Model for the basic semantics and structure of geographic information, and the geographic information service components. ISO 19103 identifies the combination of the Unified Modeling Language (UML) with its associated Object Constraint Language (OCL) as the Conceptual Schema Language and describe their use to create geographic information and service models. UML with OCL depicts an object-oriented software system in graphic form whereas its predecessor, the flowchart depicted a command oriented software system.\(^8\) ISO 19104 determines the Terminology (in accordance with International Standards and Technical Specifications developed by ISO/TC 211). The framework, concepts and methodology for Testing and Criteria are described in ISO 19105. These criteria provide the conformity to the ISO 1900 standards. Finally, in ISO 19106, a guidance is provided as to how to create the Profile of geographic information standards in different user communities.

2) Data Model Standards ISO 19109, 19107, 19108, 19123, 1914, 19137 provide a family of abstract conceptual schemas for describing the fundamental components of features as elements of geographic information. ISO 19109 speci-

\(^8\) I. Graham, Object-Oriented Methods, Addison-Wesley, 2001.
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fies a general feature model for integrating these components into features and provides rules for doing so in an Application Schema. ISO 19107 specifies UML classes for representing the Spatial Schema of features as composites of geometric and/or topological primitives. ISO 19108 does the same for the Temporal Schema of features and also specifies classes for describing relevant temporal reference systems. ISO 19123 provides a Schema for Geometric Objects as coverage of alternative representation of spatial information. ISO 19141 extends ISO 19107 to support the description of Moving Geometric Objects. ISO 19137 provides a Core Profile of ISO 19107 that is limited to describing features as simple geometric primitives of 0, 1, or 2 dimensions.

3) Data Management Standards ISO 19110-115, 19131, 19135, 19127,19138 are focused on the description of data sets. ISO 19110 specifies a Methodology for Feature Cataloguing containing definitions of feature types and their property types, including feature attributes, feature associations, and feature operations. ISO 19111 and ISO 19112 provide schema for Spatial Referencing Using Coordinates and Geographic Identifiers, respectively. The objective of ISO 19113 is to provide Quality Principles and concepts for handling quality information for geographic data. The Quality Evaluation Procedures for digital geographic datasets, consistent with the data quality principles are defined in ISO 19114. This standard also establishes a framework for evaluating and reporting data quality results, either as part of data quality metadata only, or also as a quality evaluation report. ISO 19115 standard contains structures for describing digital geographic data. The description is called as Metadata. The standard defines mandatory, conditional, optional elements. They are presented in a UML Package. The package contains one or more entities as UML Classes, which can be specified in Subclasses or generalized as Superclasses. Entities contain elements in the form of UML class attributes, which identify the discrete units of metadata. The core metadata elements (mandatory, conditional, optional) required for describing a dataset are enlisted in Appendix 2. The metadata associated with a particular physical dataset should reflect what the product dataset actually is. ISO 19131 standards on Data Product Specification only defines what the dataset should be. The data product specification covers the following aspects of the data product: identification, data content and structure, reference systems, data quality, metadata. ISO 19135 and 19127 International Standard defines the Procedure for Item Registration and the Geodetic Codes and Parameters for the population and maintenance of registers, respectively. Finally, ISO 191138 defines a set of data quality measures that can be used when reporting data quality.

4) Geographic Information Services Standards ISO 19119, 19116-117,19125/1-2, 19128, 19132-134 build on the architecture reference model of ISO 19101 to
support the specification of geographic information services. ISO 19119 extends the architecture reference model to provide a framework for developers to create software of specified individual Geographic Information Services. The software should enable users to access and process geographic data from a variety of sources across a generic computing interface within an open information technology environment. ISO 19116 supports the Positioning Services specifying an interface between position-providing devices and position-using devices. The interface conveys the observation information of measuring device to the device of users of positioning information. ISO 19117 defines a schema for describing the Portrayal of Geographic Information in a form understandable by humans. It includes the methodology for describing symbols and mapping of the schema but it does not include any standardization of them. Several supported symbol and mapping standards exist and they can be handled in a uniform way by this portrayal standard. ISO 19125/1-2 describes a common architecture for Simple Feature Access – implementing a profile on the Spatial Schema of Geographic Information described in ISO 19107. The first part contains a simple feature geometry object model using UML notation. The second part Simple Query Language (SQL) implementation of the model. ISO 19128 specifies the behavior of a Web Map Service (WMS) that produces spatially referenced maps dynamically from geographic information. This standard defines three operations: one returns service-level metadata; another returns a map as a digital image file like PNG, GIF or JPEG suitable for display on a computer screen; and an optional third operation returns information about particular features shown on a map. ISO 19132-134 contains a number of specifications to standardize the Location Base Services. The intent of ISO 19132 is to define an abstract Reference Model that is independent of implementation and communication paradigms and allows building long-term integrated local based services. ISO 19133-134 describe the data types and operations associated to Tracking and Navigation and specify the interoperability among services for Multimodal Routing and Navigation.

5) Geographic Information Encoding Standards ISO 19118, 6709, 19136, 19139 support the interchange of geographic information between systems. ISO 19118 provides a model for Encoding of data that conforms to an application schema. The standard specifies the requirements for creating: 1) encoding rules based on UML schemas, 2) encoding services, 3) encoding rule for neutral interchange of geographic data based on XML (Extensible Markup Language) and ISO/IEC (International Electrotechnical Committee) 10646 character set standards. ISO 6709 specifies the representation of coordinates used to describe point locations using XML or a single alpha-numeric string compatible
with the previous version of this international standard. ISO 19136 specifies ISO 19118 compliant XML encodings – called as Geographical Markup Language (GML). GML contains a number of the conceptual classes defined in the ISO 19100 series of International Standards, namely 19103 Conceptual schema language, 19107 Spatial schema, 19108 Temporal schema, 19109 Rules for application schemas, 19111 Spatial referencing by coordinates, 19123 Schema for coverage geometry and functions. ISO 19139 defines Geographic MetaData XML encoding derived from ISO 19115 and compliant with ISO 19118 and called as Metadata XML Schema Implementation.

6) Standards for Specific Thematic Areas – Imagery ISO 19101/2, 19115/2 specify a Reference Model for Geographic Imagery processing and adding 138 additional Metadata Elements for Imagery Datasets. ISO/TS 19101-2 extends the first part of ISO 19101 to specify a reference model for standardization in the field of geographic imagery processing. ISO 19115-2 extends ISO 19115, adding 138 additional metadata elements for describing imagery datasets. Additional thematic areas for which standards are in development or under consideration include land use classification, cadastre, and addressing systems – following up the technical development.

3. The INSPIRE Directive

ISO 19100 series of standards was adopted as technical base of INSPIRE by the European standardization organization Comité Européen Normalisation Technical Committee – CEN TC/211. However, detailed technical provisions are laid down in Implementing Rules (IR) as Commission Regulation on the next areas: 1) Metadata; 2) Data Specifications; 3) Network services (discovery, view, download, transform, invoke); 4) Data and service sharing; 5) Coordination and measures for monitoring & reporting.9 The Implementing Rules are accomplished with several Technical Guidelines (TG) to support the implementation in the member states. The Implementation Rules are legally binding documents while the Technical Guidelines are not. The structure of Inspire Directive is shown on Fig.2. Beside the different structure, 34 themes were introduced by CEN TC/211 into the INSPIRE Directive for classification of spatial data. The themes

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Figure 2. INSPIRE Structure are subdivided into three groups and included into the three appendices of the directive:

Appendix I

1. Reference systems using coordinates
2. Geographical grid system
3. Geographical names
4. Administrative units
5. Addresses
6. Land Registry plots
7. Transport networks
8. Hydrography
9. Protected areas

Appendix II

1. Height
2. Soil use
3. Ortho-imagery
4. Geology
Appendix III

1. Statistical units
2. Buildings
3. Soil
4. Land use
5. Human health and safety
6. Utilities and public services
7. Environmental protection services
8. Facilities for manufacture and industry
9. Facilities agriculture and aquaculture
10. Population distribution — demography
11. Area management/areas with limitations/regulated areas/reporting units
12. Areas with risks to the natural environment
13. Atmospheric conditions
14. Meteorological and geographic characteristics
15. Oceanographic, geographic characteristics
16. Maritime regions
17. Bio-geographic areas
18. Habitats and biotopes
19. Distribution of species
20. Energy sources
21. Mineral sources

The Legislation of INSPIRE have been elaborated by Drafting Teams (DTs). They are the groups of expert selected by the Commission to participate in the process of creation of the next IRs and TGs in the fields of metadata, network services, data and service sharing and monitoring and reporting. They were set-up based on the INSPIRE call published on 9th March 2005, and their composition has since then evolved due to the availability of experts and changes in the requirements of the DTs. The overview of IRs and TGs below is based on the very reach information of official site of INSPIRE (http://inspire.jrc.ec.europa.eu) and on Robert Thomas lecture in Inspire Conference, Florence Italy 23-27 April 2013.¹⁰

Metadata IRs


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**Metadata TG**

1) INSPIRE Metadata Implementing Rules: Technical Guidelines based on EN ISO 19115 and EN ISO 19119 (Version 1.2) 16.06.2010

This Regulation sets out the requirements for the creation and maintenance of metadata for spatial data sets, spatial data set series and spatial data services corresponding to the themes listed in Annexes I, II and III to Directive 2007/2/EC. It contains the terminology applied in the Regulation, the definitions of metadata elements and the conditions and multiplicity (occurrence) of them. The associated TG describe the application of ISO 19115, 19119, 19108, 19139 in INSPIRE. The differences in names and classifications are in Appendix 2. compiled from this document.

**Data Specification IR**


**Technical Guidelines Annex I**

1) INSPIRE Data Specification on Administrative Units – Guidelines v3.0.1 03.05.2010
2) INSPIRE Data Specification on Cadastral Parcels – Guidelines v 3.0.1 03.05.2010
3) INSPIRE Data Specification on Geographical Names – Guidelines v 3.0.1 03.05.2010
4) INSPIRE Data Specification on Hydrography – Guidelines v 3.0.1 03.05.2010
5) INSPIRE Data Specification on Protected Sites – Guidelines v 3.1.0 03.05.2010
6) INSPIRE Data Specification on Transport Networks – Guidelines v 3.1 03.05.2010
7) INSPIRE Data Specifications on Addresses – Guidelines v 3.0.1 03.05.2010
8) INSPIRE Specification on Coordinate Reference Systems – Guidelines v 3.1 03.05.2010
9) INSPIRE Specification on Geographical Grid Systems – Guidelines v 3.0.1 03.05.2010

**Draft Technical Guidelines Annex II & III**


Gábor Bartha

**Framework Documents**

34) Guidelines for the encoding of spatial data 11.06.2013
35) INSPIRE Data Specifications – Base Models – Activity Complex 05.04.2013
36) INSPIRE Data Specifications – Base Models – Coverage Types 05.04.2013
37) INSPIRE Data Specifications – Base Models – Generic Network Model 05.04.2013
38) INSPIRE Generic Conceptual Model 05.04.2013
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40) Data Specifications Template 04.02.2013
41) Definition of Annex Themes and Scope (D 2.3, Version 3.0) 03.10.2008
42) Methodology for the development of data specifications: baseline version (D 2.6, Version 3.0) 20.06.2008

This Regulation sets out the requirements for technical arrangements for the inter-operability and, where practicable, harmonization of spatial data sets and spatial data services corresponding to the themes listed in Annexes I, II and III to Directive 2007/2/EC. TGs determine data specifications in every theme. Framework Documents determine the key pillars of interoperability, namely conceptual data models, encoding, harmonized vocabularies, unambiguous register based on ISO 1900 standards.

Network Services IRs

Network Services TGs

Guidance Documents
1) Technical Guidance for the implementation of INSPIRE View Services 04.04.2013
2) Technical Guidance for the implementation of INSPIRE Download Services 12.06.2012
3) Technical Guidance for the implementation of INSPIRE Discovery Services 07.11.2011
5) Draft Technical Guidance for INSPIRE Coordinate Transformation Services 15.03.2010

Framework Documents
Network Services Architecture (Version 3.0) 30.09.2008
7) Conformance testing state of play for services 17.12.2007

Gábor Bartha
8) INSPIRE Network Services Performance Guideline 13.12.2007

This Regulation sets out the requirements for the establishment and maintenance of the Network Services provided for in Article 11(1) of Directive 2007/2/EC and obligations related to the availability of those services to the public authorities of the Member States and third parties pursuant to Article 12 of that Directive. TGs determine the view, download and discovery services. Framework Documents gives a guideline to Network Services and specify SOAP (Simple Object Access Protocol) for exchanging structured information in Web Services. The structure of INSPIRE data specification and network service is shown on Fig. 3.

Data and Service Sharing IR

1) COMMISSION REGULATION (EU) No 268/2010 of 29 March 2010 implementing Directive 2007/2/EC of the European Parliament and of the Council as regards the access to spatial data sets and services of the Member States by Community institutions and bodies under harmonized conditions

Data and Service Sharing TG

Guidance on the ‘Regulation on access to spatial data sets and services of the Member States by Community institutions and bodies under harmonized conditions’ 09.01.2013

This Regulation establishes harmonized conditions of access to spatial data sets and services in accordance with Article 17 of Directive 2007/2/EC. TG defines good practice in data and service sharing

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**Figure.3. INSPIRE Spatial Data and Network service schema**

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Monitoring and Reporting IR


This Decision lays down detailed rules on monitoring by Member States of the implementation and use of their infrastructures for spatial information and on reporting on the implementation of Directive 2007/2/EC
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The roadmap of implementation of INSPIRE IRs are summarized in the next Table 1. below.

<table>
<thead>
<tr>
<th>Milestone date</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>15-May-2010</td>
<td>Implementation of provisions for monitoring and reporting</td>
</tr>
<tr>
<td>03-Dec-2010</td>
<td>Metadata available for spatial data sets and services corresponding to Annex I and II</td>
</tr>
<tr>
<td>09-May-2011</td>
<td>Member States shall provide the Discovery and View Services with initial operating capability</td>
</tr>
<tr>
<td>30-Jun-2011</td>
<td>The EC establishes and runs a geo-portal at Community level</td>
</tr>
<tr>
<td>19-Oct-2011</td>
<td>Implementation of Regulation as regards the access to spatial data sets and services of the Member States by Community institutions and bodies under harmonised conditions for new arrangements</td>
</tr>
<tr>
<td>09-Nov-2011</td>
<td>Discovery and view services operational</td>
</tr>
<tr>
<td>28-Jun-2012</td>
<td>Member States shall provide the Download Services with initial operating capability</td>
</tr>
<tr>
<td>28-Jun-2012</td>
<td>Member States shall provide the Transformation Services with initial operating capability</td>
</tr>
<tr>
<td>28-Dec-2012</td>
<td>Download services operational</td>
</tr>
<tr>
<td>28-Dec-2012</td>
<td>Transformation services operational</td>
</tr>
<tr>
<td>Milestone date</td>
<td>Description</td>
</tr>
<tr>
<td>----------------</td>
<td>-------------</td>
</tr>
<tr>
<td>19-Apr-2013</td>
<td>Implementation of Regulation as regards the access to spatial data sets and services of the Member States by Community institutions and bodies under harmonised conditions for existing arrangements</td>
</tr>
<tr>
<td>03-Dec-2013</td>
<td>Metadata available for spatial data sets and services corresponding to Annex III</td>
</tr>
<tr>
<td>October 2015</td>
<td>Newly collected and extensively restructured Annex II and III spatial data sets available</td>
</tr>
<tr>
<td>October 2020</td>
<td>Other Annex II and III spatial data sets available in accordance with IRs for Annex II and III</td>
</tr>
</tbody>
</table>

**Table 1. Roadmap of INSPIRE**
Appendix 1.
Standards of ISO 19100 series

<table>
<thead>
<tr>
<th>Number</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>6709</td>
<td>Standard representation of latitude, longitude and altitude for geographic point locations</td>
</tr>
<tr>
<td>19101</td>
<td>Reference model</td>
</tr>
<tr>
<td>19101-2</td>
<td>Reference model – Part 2: Imagery</td>
</tr>
<tr>
<td>19103</td>
<td>Conceptual schema language</td>
</tr>
<tr>
<td>19104</td>
<td>Terminology Introduction</td>
</tr>
<tr>
<td>19105</td>
<td>Conformance and testing</td>
</tr>
<tr>
<td>19106</td>
<td>Profiles</td>
</tr>
<tr>
<td>19107</td>
<td>Spatial schema</td>
</tr>
<tr>
<td>19108</td>
<td>Temporal schema</td>
</tr>
<tr>
<td>19109</td>
<td>Rules for application schema</td>
</tr>
<tr>
<td>19110</td>
<td>Methodology for feature cataloguing</td>
</tr>
<tr>
<td>19111</td>
<td>Spatial referencing by coordinates</td>
</tr>
<tr>
<td>19112</td>
<td>Spatial referencing by geographic identifiers</td>
</tr>
<tr>
<td>19113</td>
<td>Quality principles</td>
</tr>
<tr>
<td>19122</td>
<td>Qualifications and Certification of personnel</td>
</tr>
<tr>
<td>19123</td>
<td>Schema for coverage geometry and functions</td>
</tr>
<tr>
<td>19124</td>
<td>Imagery and gridded data components</td>
</tr>
<tr>
<td>19125-1</td>
<td>Simple feature access – Part 1: Common architecture</td>
</tr>
<tr>
<td>19125-2</td>
<td>Simple feature access – Part 2: SQL option</td>
</tr>
<tr>
<td>19126</td>
<td>Profile – FACC Data Dictionary</td>
</tr>
<tr>
<td>19127</td>
<td>Geodetic codes and parameters</td>
</tr>
<tr>
<td>19128</td>
<td>Web Map server interface</td>
</tr>
<tr>
<td>19129</td>
<td>Imagery, gridded and coverage data framework</td>
</tr>
<tr>
<td>19130</td>
<td>Sensor and data models for imagery and griddled data</td>
</tr>
<tr>
<td>19131</td>
<td>Data product specifications</td>
</tr>
<tr>
<td>19132</td>
<td>Location based services possible standards</td>
</tr>
<tr>
<td>19133</td>
<td>Location based services tracking and navigation</td>
</tr>
<tr>
<td>19134</td>
<td>Multimodal location based services for routing and navigation</td>
</tr>
</tbody>
</table>
### Geoinformation – law and practice

<table>
<thead>
<tr>
<th>19114 – Quality evaluation procedures</th>
<th>19135 – Procedures for registration of geographical information items</th>
</tr>
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<tbody>
<tr>
<td>19115 – Metadata</td>
<td>19136 – Geography Markup Language</td>
</tr>
<tr>
<td>19115-2 – Metadata – Part 2: Extensions for imagery and gridded data</td>
<td>19137 – Generally used profiles of the spatial schema and of similar important other schemas</td>
</tr>
<tr>
<td>19116 – Positioning services</td>
<td>19138 – Data quality measures</td>
</tr>
<tr>
<td>19117 – Portrayal</td>
<td>19139 – Metadata – Implementation specification</td>
</tr>
<tr>
<td>19118 – Encoding</td>
<td>19140 – Technical amendment to the ISO 191** Geographic information series of standards for harmonization and enhancements</td>
</tr>
<tr>
<td>19119 – Services</td>
<td>19121 – Imagery and gridded data</td>
</tr>
<tr>
<td>19120 – Functional standards</td>
<td></td>
</tr>
</tbody>
</table>
Chapter IV. Geoinformation in UE regulations – the INSPIRE directive

**Appendix 2.**

*Names and classification of metadata core elements in ISO 19115 and INSPIRE*

<table>
<thead>
<tr>
<th>ISO 19115 Metadata Core Elements</th>
<th>INSPIRE Metadata Core Elements</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dataset title (M)</td>
<td>Resource Title (M)</td>
</tr>
<tr>
<td>Dataset reference date (M)</td>
<td>Temporal Reference (C)</td>
</tr>
<tr>
<td>Dataset responsible party (O)</td>
<td>Responsible organization (O)</td>
</tr>
<tr>
<td>Geographic location of the dataset (C)</td>
<td>Geographic Bounding Box (M)</td>
</tr>
<tr>
<td>Dataset language (M)</td>
<td>Resource Language (C)</td>
</tr>
<tr>
<td>Dataset character set (C)</td>
<td>–</td>
</tr>
<tr>
<td>Dataset topic category (M)</td>
<td>Topic category (M)</td>
</tr>
<tr>
<td>Spatial resolution of the dataset (O)</td>
<td>Spatial Resolution (O)</td>
</tr>
<tr>
<td>Abstract describing the dataset (M)</td>
<td>Abstract (M)</td>
</tr>
<tr>
<td>Distribution format (O)</td>
<td>–</td>
</tr>
<tr>
<td>Additional extent information for the dataset (O)</td>
<td>Temporal extent (M)</td>
</tr>
<tr>
<td>Spatial representation type (O)</td>
<td>–</td>
</tr>
<tr>
<td>Reference System (O)</td>
<td>–</td>
</tr>
<tr>
<td>Lineage (O)</td>
<td>Lineage (M)</td>
</tr>
<tr>
<td>On-line resource (O)</td>
<td>Resource Locator (O)</td>
</tr>
<tr>
<td>Metadata file identifier (O)</td>
<td>–</td>
</tr>
<tr>
<td>Metadata standard name (O)</td>
<td>–</td>
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<tr>
<td>ISO 19115 Metadata Core Elements</td>
<td>INSPIRE Metadata Core Elements</td>
</tr>
<tr>
<td>----------------------------------</td>
<td>--------------------------------</td>
</tr>
<tr>
<td>Metadata standard version (O)</td>
<td>-</td>
</tr>
<tr>
<td>Metadata language (C)</td>
<td>Metadata language (M)</td>
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<tr>
<td>Metadata character set (C)</td>
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<td>Metadata date stamp (M)</td>
<td>Metadata Date (M)</td>
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<td>-</td>
<td>Resource Type (M)</td>
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<tr>
<td>-</td>
<td>Conformity (M)</td>
</tr>
<tr>
<td>-</td>
<td>Conditions for access and use (M)</td>
</tr>
<tr>
<td>-</td>
<td>Limitations on public access (M)</td>
</tr>
</tbody>
</table>

“M” indicates that the element is mandatory. “O” indicates that the element is optional.
“C” indicates that the element is mandatory under certain conditions.
Chapter V. Implementation of the INSPIRE Directive – a comparative law perspective

1. Introduction

Access to information plays a critical role in an individual’s knowledge-based participation in the life of his or her society. This leads to the creation of the information society, for which access to geoinformation is crucial. Spatial information or geoinformation may be understood as data directly or indirectly referring to a specific location or a geographical area. This definition may be considered to be a leading one both in the legislation of the EU and the Member States and in doctrine reproduced in academic work.


2 W. Paluszyński, Rola geoinformacji w rozwoju społeczeństwa informacyjnego, Roczniki Geomatyki, vol. V No. 6, 2007, p. 125

3 The analysis of the literature clearly suggests that, in the opinion of many authors, it is impossible to establish a uniform, interdisciplinary definition of either information or data (cf. J.O. Püschel, Informationen des Staates als Wirtschaftsgut, Berlin 2006, p. 39–40). However, some attempts have been made: G. Szpor proposes an interdisciplinary definition of information as immaterial, transferable goods that reduce uncertainty and of data as processable signs of zero informational value (G. Szpor, C. Martysz, K. Wojsyk, Ustawa o informatyzacji działalności podmiotów realizujących zadania publiczne. Komentarz, Warszawa 2007, p. 39-40), while N. de Lange defines information as a message linked to the meaning for the recipient. A message is understood as a finite string of signals together with their spatial and temporal assignment, which were put together according to earlier established rules. Signals are elementary, recognizable modulations such as: tone, facial expressions, light signal, movement, and electric impulse. According to N. de Lange data is a set of signs or repeating functions which, on the basis of convention, constitute information. (N. de Lange, Geoinformatik in Theorie und Praxis, Heidelberg 2013, p. 11–12). In spite of the dogmatic differences between the notions of data and information just outlined, it is indisputable that sets of data are information, thus, for the sake of this paper, both terms will be interchangeable.

4 See for example, EU law (Art. 3(2) INSPIRE Directive); Poland (art. 3 item 1 u.i.i.p.); Germany (at federal level – §3 I GeoZG); Austria (§3 item 2 AGeoDIG); Spain (§3 sec. 1 letter b ES Ley 14/2010 [despite the INSPIRE Directive in the Spanish translation referring to spatial data - datos espaciales - the implementing Regulation uses the term geographical data – “datos geográficos” - as well as in the whole infrastructure of spatial/geographic data. The change of the nomenclature does not, however, change the correctness of the implementation of the
Spatial data are used by both private and public sector organizations. Together with spatial data services, spatial information facilitates, for example, the following decision-making processes: ‘incident management’ by monitoring the water level or planning evacuation routes for citizens; environmental protection (e.g. facilitating evaluation of the condition of the environment and reducing spending connected to reporting obligations); logistics planning, communication networks planning, spatial planning itself (evaluation of the impact of administrative decisions and other factors on a given immovable) and decisions concerning the localization of gas pipe lines and electricity power lines; planning in the mining industry (i.e. easier resource management); marketing campaigns and the evaluation of their efficiency and evaluation of business competitiveness by price comparison; monitoring and preventing threats to public safety by creating “crime maps” and sending safety personnel to the most hazardous areas; and decisions about health care – creating maps of increased incidence of individual diseases and establishing the reason behind it.5

It is an obvious fact that geoinformation-based services are now widely used. To take just one example, according to data provided by the producer of the Google Maps mobile software, in 2010 their service was already used by 100 million persons monthly,6 and this number is still increasing as Google have indicated that recently they registered a 900 millionth Android mobile device.7 Google Earth and Google Maps applications are ranked, respectively, 17th and 25th among free apps in the Apple Store.8 The popularity of the services mentioned earlier provided by global companies confirms the observation that there has been a change of heart, or even a revolution in the current information structure: presently, it is no longer the state that is the major provider of, for example, spatial information.


7 See: http://venturebeat.com/2013/05/15/900m-android-activations-to-date-google-says/, as of 28 January 2014.

Chapter V. Implementation of the INSPIRE Directive...

The intervention of the private sector and their services offering access to spatial data does not alter the fact that, in business trading, access to geoinformation has been at the public authorities’ disposal since the beginning of this century. The right to have it at one’s disposal is of great economic significance. Much ink has been spilled on the benefits to the economy and citizens in connection with the usage of spatial information. It is estimated that the ratio of expenditure on establishing the infrastructure for spatial data in comparison to the savings/earnings it can potentially bring equals 1 to 200. Spatial information in Germany is considered to be a valuable digital resource, but it is only possible to give an estimate of its value. For Germany, the potential of spatial information is assessed as circa 8 billion EUR and, according to the same assessment, its full usage could help create about 30,000 new workplaces. According to the European Commission,
the expenditure on the creation of the European spatial information infrastructure, mentioned in the INSPIRE Directive, should not exceed 1-2% of the value of all expenditures for acquiring spatial information in the period of 10 years. According to the estimations, the cost of building the spatial information infrastructure in Poland should reach around 650 million PLN in 10 years, although the funding sources have not yet been precisely defined.

2. Spatial information in the legal system

Spatial information has a unique place not only in the economic system because of its value, but also in the legal system of the EU and all of the Member States. It is a kind of information with a specially regulated access.

Spatial data can simultaneously meet the defining criteria of other types of information. Thus, they can belong to the public information set, may constitute environmental information, and can be classified e.g. as falling within the information autonomy of an individual in the context of personal data protection. The basic difference in the rules of access to public and environmental information and to personal data lies in the nature of the information itself. The analysis of the regulations allows us to claim that there is a qualified right of access, that is to say, an assumed possibility for accessing public and environmental information.

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14 Government draft Act concerning the spatial information infrastructure, No. 2562 of 27.11.2009, p. 17.
15 E. Krawczyk, an opinion commissioned by the Bureau of Research entitled Potencjalne zagrożenia dla sektora finansów publicznych (budżetu państwa i budżetów jednostek samorządu terytorialnego) w związku z wejściem Ustawy o infrastrukturze informacji przestrzennej (print 2562), Warszawa 30.12.2009, p. 3.
16 In Poland, this is understood as: „Every information concerning public matters” (art. 1 sec. 1 u.d.i.p.)
17 Environmental information within art. 8 and art. 9 u.d.i.s., read in connection with art. 3 item 39 POS, and further within art. 74 sec 3 KRP.
18 In the view of u.o.d.p., these are all kinds of information concerning an identified person or a person that can be identified. A person who can be identified is a person whose identity can be specified directly or indirectly, especially by reference to an identification number or one or several unique factors describing their physical, physiological, mental, economic, cultural or social traits. However, an information is not considered to enable a person’s identification when it requires expending or undertaking excessive costs, time or actions (art. 6 u.o.d.p.).
tion, and geoinformation too,\(^{19}\) as a refusal to make it available requires proof that disclosure of this data is against the law and can only be avoided on the basis of statutory provisions.\(^{20}\) By contrast, in the case of information concerning specific persons, there is a reversed assumption, because “everybody has a right to protect the information about their personal data”, and processing “can be utilized for the sake of the public good, the good of the person in question or the good of third parties in the scope and mode specified by the law.”\(^{21}\)

3. The INSPIRE Directive

Directives impose an obligation on Member States to which they are addressed to achieve the desired result. They leave the freedom of choosing the form and means of realization of the directive’s goal, however, to the national authorities.\(^{22}\) The Commission uses its powers, conferred by the Council in order for it to realize established norms, to provide for the proper functioning and development of the common market.

The notion of a state should be treated broadly. The state is obliged to take all actions to reach the goal (result) mentioned in the directive. This concerns all public authorities in a given State Member.\(^{23}\)

Directives are characterized by the requirement of implementation within the legal system of each of the Member States, allowing them to choose the form and means of achieving that. To maintain the coherence of community law, it is essential that every Member State transposes the Community’s directives into their national laws in their entirety, comprehensively and on time. In spite of the fact that the Member States decide about the form and the mode of introducing the laws into their legal system, it is necessary that the measures taken by them result in an effective and consistent execution of community law when transposed into national law. The Commission watches over the Member States to ascertain whether these obligations are fulfilled.\(^{24}\) Despite the absence of a requirement to adopt within the legal system of the Member State a new law regulating the

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\(^{19}\) It is one of the basic premises of regulations of this kind (F. Schoch, M. Kloepfer, Informationsfreiheitsgesetz. Entwurf eines Informationsfreiheitsgesetzes für die Bundesrepublik Deutschland, Berlin 2002, p. 42 nb. 1).

\(^{20}\) Cf. art. 61 sec. 3 i art. 74 sec. 3 KRP read in connection with art. 1 sec. 1 u.d.i.p. and art. 8 u.d.i.s., art. 9 sec. 1 u.i.i.p.

\(^{21}\) Art. 1 u.o.d.o.

\(^{22}\) Art. 249 TWE, presently 288 TFUE.

\(^{23}\) Cf. judgment ETS of 10.4.1984 r., Sabine von Colson i Elisabeth Kamann v Land Nordrhein-Westfalen (Case C-14/83, para. 26); judgment ETS of 13.11.1990 Marleasing SA v La Comercial Internacional de Alimentacion SA (Case C-106/89, para. 8)

\(^{24}\) Art. 17 sec. 1 TUE.
matter in precisely the same way as the directive (since only the specific result is the objective), a very popular way of implementing a directive is to pass a measure regulating the matter set out in the Community legislation with almost the same content as the directive itself. Legal acts of Member States may contain, for example, different formulations from those in the directive, different definitions of given concepts, or give other meanings to already defined items. It is only crucial that the aim of the Community’s legislation is met. The newly published legal act transposing the provisions of a given directive has to be coherent – not least terminologically – with other state legislation.

The judicature of both the Court of Justice of the European Union (CJEU) and the constitutional courts of the Member States usually give priority to community law over state law. The discrepancy relates to legislation at the constitutional, since the question arises whether the primacy of EU law also applies to constitutional laws. According to Court of Justice of the European Union, this is indeed the case, as was confirmed in its judgment in Kreil v Germany. The Polish Constitutional Court seems to disagree. By contrast, however, the primacy of Community law over ordinary state law does not raise any questions since this has been confirmed by judgments of both state constitutional courts and the CJEU. It means that state law is subordinate to Community law and has to be adapted in order to meet the goals of a directive. If not, a country may be subject to sanctions.

In a situation where a directive is not implemented correctly, or at all, a state may be subject to legal action for the infringement of the treaty provisions and may be liable in damages to affected persons who, because of the tardiness of the Member State in implementing the new provisions, are not able to exercise rights

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25 The INSPIRE Directive was implemented in separate acts in Poland (u.i.i.p.) and in Germany (GeoZG) at the federal level. In Mecklenburg-Western Pomerania (GeoVermG M-V) the topics of geoinformation and geodesy were amalgamated in one measure, while in France the implementation took the form of insertion into the Environmental Code (Code de l’environnement).

26 ETS judgment of 9.4.1987, Commission v The Republic of Italy, (Case C-363/85, Nb. 7); cf. also e.g.: ETS judgment of 23.5.1985. Commission v The Federal Republic of Germany, (Case C-29/84, paras 22–23).

27 Cf. CJEU judgment of 11 January 2000 Tanja Kreil v The Federal Republic of Germany (Case C-285/98)

28 Cf. TK judgment of 11 May 2005 File No. K 18/04, p. 41 item 4.2. This judgment concerned, among other things, the conformity of the Treaty of Accession of Poland to the EU, signed on 16 April 2003 in Athens (Journal of Laws [Dz.U.] of 2004 No. 90, item 864) with art. 8 sec. 1 and art. 90 sec. 1 of the Constitution of the Republic of Poland,

29 Cf. for example CJEU judgment of 5 February 1963 NV Algemene Transport- en Expeditie Onderneming van Gend & Loos v Nederlandse administratie der belastingen (Case C-26/62); Judgment of the Tribunal of 15 July 1964 Flaminio Costa v E.N.E.L. (Case C-6/64);
guaranteed by the EU law. In specified situations a directive can be applied directly. However, such a solution would be very difficult when it comes to the INSPIRE directive, and in an obvious way it would limit and hamper the access to spatial data.

In 2007 Directive 2007/2/EC of the European Parliament and of the Council of 14 March 2007 came into force. It establishes the infrastructure of spatial information in the European Community. This directive was named INSPIRE. Its goal is to create a legal framework to establish a pan-European infrastructure of spatial information, based on the infrastructure of spatial information in the Member States, thus facilitating and systematizing access to spatial information, mainly by standardization of spatial data and assuring such quality that its reuse is possible and profitable. In principle, the Directive does not oblige Member States to gather new data, but only obliges them to share the data they lawfully possess which are specified in the Annexes to the directive, is held by public

30 Cf. CJEU of 19 November 1991 Andrea Francovich i Danila Bonifaci and others v The Republic of Italy (connected cases C-6/90 and C-9/90)

31 It is noteworthy that the INSPIRE Directive mentions in its Preamble the access and use of „spatial information” (cf. for example recital No. 3 of the preamble to the INSPIRE Directive), and specified regulations concern spatial data sets and sharing services (Art. 4 and 11 of the INSPIRE Directive). Once it is assumed that data make up information, there is no need to seek terminological inconsistency here.

32 Cf. recitals No. 3 and 5 of the preamble to the INSPIRE Directive.

33 Cf. recital No. 12 of the preamble to the INSPIRE Directive and Art. 4(4) of the INSPIRE Directive.

34 Art. 4(1)(c) of the INSPIRE Directive uses the terms „holding” (in the Polish text, translated literally: „possessing or storing”) and „producing, receiving, managing, or updating” spatial data sets. U.i.i.p. in art. 4 sec. 1 item 3 avoids using the term „possessing data” (cf. footnote 8) replacing it with „maintaining” which is probably connected to the subject entitled to managing specific data. However, art. 4 sec. 2 u.i.i.p. returns to the terms contained in the INSPIRE Directive: „possessing and storing” of data sets. Using the term „data processing” as in the sense of art. 7 item 2 u.o.d.o., meaning all the operations of gathering, recording, storing, developing, changing, sharing, and deleting data, would be pointless. It has a wider semantic scope, especially in terms of “gathering” or “deleting” data. “Gathering” itself does not denote finishing the process, and consequently the possibility of sharing data, which is only possible after having “gathered” data. Thus, even keeping the present fortifications concerning rights to ordering data, especially when it comes to the protection of intellectual property, and the regulations concerning reference versions of data (cf. art. 4 sec. 2 and 3 u.i.i.p.), the term „processing” seems to be too broad. In the case of UODO, the term “processing” also determines the scope of application of the whole Act: generally, whether before gathering or after deleting data, data processing is out of the question. (cf. A. Drozd, Ustawa o ochronie danych osobowych. Komentarz. Wzory pism i przepisy., Warszawa 2008, p. 62 nb. 5). The scope of use of u.i.i.p. is shaped analogously. It may be said that it is the set between obtaining data in an adequate form and deleting it, excluding the processes of gathering and deleting.
bodies\textsuperscript{35} in an electronic format, and, moreover, relates to areas of the Member States’ jurisdiction.\textsuperscript{36}

The legal basis for passing the directive was art. 175(1) TEC (now Art. 192 of the Treaty on the Functioning of the European Union) concerning environmental protection. Because of this, establishing a European spatial information infrastructure should influence protection of the environment. This assumption is confirmed by the Preamble to the INSPIRE Directive.\textsuperscript{37} The official goal is to facilitate the realization of community policies in the scope of environmental protection and policies or actions that may impact on the environment.\textsuperscript{38} The justifications of the measures implementing the Directive seem to show the real reason for its adoption – namely, possible economic benefits arising from the easy access to geoinformation with the additional pointer to the impact of such access on building the information and civil society. The justification put forward for the Polish law implementing the INSPIRE Directive states that “the basic goal of creating the infrastructure for spatial information is the optimization of the costs of acquiring spatial data by the public administration units, and to facilitate access to spatial data gathered by the administration on different levels of the public authorities and economic sectors to all interested subjects.”\textsuperscript{39} The goals mentioned would not provide legal grounds for adopting the Directive. Where a variety of information can be processed and correlated, better effects and income can be...


\textsuperscript{36} Art. 4(1) of the INSPIRE Directive.

\textsuperscript{37} Cf. recitals 1, 2, 4, 10, 16, 18, and 29 of the preamble to the INSPIRE Directive.

\textsuperscript{38} Art. 1(1) of the INSPIRE Directive.

\textsuperscript{39} The government draft of the Infrastructure for Spatial Information Act [Print No. 2562 of 27.11.2009, p. 39 (p. 1 of the justification)]. The drafter notices the economic aspects connected to the environment-related information duty, but one may form the well-grounded impression that it is not the aim of the Act in question. The German legislator in the justificatory memorandum to the draft of the Act points out that the INSPIRE Directive was adopted on the basis of art. 175 TEEC concerning environmental protection, and the justification focuses on this aim, but the analysis of spatial data encompassed by the Directive shows that the policy of environmental protection is a very broad notion because it concerns almost all areas (cf. Entwurf eines Gesetzes über den Zugang zu digitalen Geodaten, Drucksache 16/10530 of 10.10.2008, p. 11). Admittedly, among the goals in enacting GeoZG stated in §1 sec. 2 of that law, there is a statement that GeoZG establishes a legislative framework for using spatial data and services, especially for actions influencing the environment. This provision, however, seems to be only an attempt to fully implement the INSPIRE Directive and, in practice, it has only an axiological function.

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achieved. Consequently, by creating an infrastructure that enables and provides access to information, it is profitable to include as much data as possible, while at the same time maintaining a uniform standard and interoperability, so to make the use of information and the relationships between the items of data economically viable and avoid the need for excessive financial input. The idea of harmonization and using synergy rules in reference to spatial data is of great interest and worth realising. However, dogmatically, from the legal point of view, some solutions generate some doubts.

The fact that using the infrastructure for spatial information is not exclusive to environmental protection is surely not an error in the implementation process. Since the directive does not provide for exclusivity in using the infrastructure for spatial information only for environmental protection, it means, a contrario, that such use is acceptable provided the goals of the Directive are at least met. Establishing the infrastructure and access regulations for spatial data and services at the community level was and is a necessity. It was determined that the main obstacle to full data usage is the time-consuming and costly searching for existing spatial data or testing whether it can be used in a given task.40 As the Directive’s objective could not be reached in a satisfactory way by the Member States because of the supranational aspects and the general need for coordinating the access, sharing, and conditions for use in the Community, according to the principle of subsidiarity, adoption of the directive is justified. It is worth considering creating a direct legal basis for similar initiatives in the future.

4. The implementation of the INSPIRE Directive

The INSPIRE Directive, as with every legal act of this type, had to be implemented in the individual legal systems of the Member States. The deadline set was 15 May 2009.41 Meeting the deadline was troublesome for the Member States: a delayed transposition is a proof for that,42 as are the CJEU judgments concerning this matter.43 The complexity of the subject, together with the complexity of the implementation of the INSPIRE Directive, confirms the fact that the

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40 Recital No. 15 of the preamble to the INSPIRE Directive.
41 Art. 24(1) of the INSPIRE Directive.
42 Despite the delayed implementation, the CJEU did not give judgment against, for example, Poland or the Federal Republic of Germany. U.i.i.p. implementation of INSPIRE into the Polish legal system came into force only on 07.06.2010, while the last Act for implementation in Germany was R-P LGDIG in Rhineland-Palatinate and that came into force on 31.12.2010.
43 Cf. Case C-548/10, CJEU judgment of 28.7.2011, European Commission v the Republic of Austria, O. J. C 298 of 8.10.2011, p. 10; Case C-321/10, CJEU judgment of 17.2.2011, European Commission v the Kingdom of Belgium, O. J. C 103 of 2.4.2011, p. 10;
creation of the infrastructure for spatial information touches almost every policy area. This explains why there is no closed spatial information catalogue, and a dynamic development and the popularization of the services based on location data additionally makes creating such a catalogue pointless. Because of this, one can enumerate the examples of spatial data from the sets in the Annexes to the INSPIRE Directive and the implementing legislation. This set includes, among others, coordinate reference systems, geographical names, administrative units, addresses, cadastral parcels, communication networks, and information concerning protected areas.

According to the Polish government statement, the delay in transposition of the INSPIRE Directive was caused by several factors: the extensiveness of the issue and time-consuming negotiations at governmental and self-governmental (i.e. provincial, district, and communal) levels; the necessity to establish 12 leading bodies, due to the scattered qualifications connected with the realization of the tasks regulated in the Directive and consequential doubts in the field of authority; a close connection to the public registers regulated by the u.p.g.k. (polish Cartographic and Geodetic Law), and the fact that spatial data in their registers have a referential meaning to other infrastructure data, which created a need to make drafts of new regulations for u.p.g.k. and executive measures with a scope required for introducing the INSPIRE Directive; the need to sustain the coherence of the legal system, which in effect compelled the drafting of amendments to various other primary legislation (the Mining and Geological Law, the Public Statistics Act, the Environmental Protection Law, the Nature Protection Act

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45 Cf. e.g. Annex I paras 1, 3-7, and 9 of the INSPIRE Directive, items 1, 3-7, 9 Chapter 1 of the u.i.i.p. Annex.
46 Ministers in charge of construction, local spatial planning and land management, and the housing industry; maritime economy; culture and the protection of the national heritage; agriculture; environment; health; and Surveyor General of Poland; Geologist General of Poland Chief Environmental Protection Inspector; Chief Nature Conservation Officer; the Head of the Central Statistical Office; the Head of the National Council of Water Management.
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and the Recycling of Vehicles Withdrawn from Use Act\textsuperscript{51} [cf. art. 23-28 u.i.i.p.]);
and, finally, the economic situation in the Republic of Poland in the context of
providing public funding within the state budget for the realization of new tasks
resulting from the implementation of the INSPIRE Directive.\textsuperscript{52}

5. Acts implementing the INSPIRE Directive

In order to compare the acts implementing the INSPIRE Directive, I chose
the legal acts that transpose it in Poland and Germany – countries with different
legal systems (unitary v. federal) – showing different possibilities of transposing
the INSPIRE Directive.

Taking these chosen judicial systems as a standpoint, we can observe a trans-
position model using separate “geodetic” and “geoinformational” legislation (as
was done in Poland – and most of the \textit{Länder} of the Federal Republic of Germany)
and a model merging both matters in one measure. Hesse (adopting the Public
Geodesy and Geoinformation Act of 6 June 2007) and Mecklenburg-Western Po-
merania (enacting the Official Geoinformation and Geodesy Act of 16 Decem-
ber 2010) constitute examples of the latter group. An interesting approach was
undertaken in Brandenburg, where the obligation of implementing the INSPIRE
Directive caused the removal of the core matter concerning geoinformation from
the Brandenburg Geodesy Act\textsuperscript{53} and the adoption of a new geoinformation Act.
Other \textit{Länder}, a part. of whose statute book refers to geoinformation and even has
this term in the title of the Geodesy Act, but which decided nonetheless to issue
a new regulation implementing the INSPIRE Directive, include Saxony Anhalt\textsuperscript{54}
and Thuringia.\textsuperscript{55}


\textsuperscript{52} The response of the Republic of Poland of 25 September 2009 to the formal opinion by
the European Community Commission submitted to Poland pursuant to art. 226 of the TEEC
[now art. 258 TFEU] concerning the failure to notify the national implementing measures
2007 establishing the infrastructure for spatial information in the European Community (IN-
SPIRE) (O J L 108 of 25.04.2007, p. 1 as amended) (contravention No. 2009/0397), with the

\textsuperscript{53} Gesetz über das amtliche Vermessungswesen im Land Brandenburg (Brandenburgi-

\textsuperscript{54} Vermessungs- und Geoinformationsgesetz Sachsen-Anhalt (VermGeoG LSA) version
of 15 September 2004, GVBl. LSA 2004, 716.

\textsuperscript{55} Thüringer Vermessungs- und Geoinformationsgesetz (ThürVermGeoG) of 16 Decem-
To portray the particular provisions implementing the INSPIRE Directive, the following legislation was chosen: the Polish u.i.i.p., the German (federal) GoeZG, and in particular two laws of the Länder, namely North Rhine-Westphalia (GeoZG NRW) and Bavaria (BayGDIG). The key elements of the characteristics of the regulations are the aim of the regulation, the subjective and objective scope of use, and the conditions for access to spatial information.

6. Aims of the regulation, definitional differences and their meaning

The main and core aim of all the legislation in question is the transposition of the INSPIRE Directive in the individual national legal systems.56

The Polish regulation on the infrastructure for spatial information aims to regulate the rules for creating and using57 the infrastructure for spatial information and to determine the subjects responsible for that.58 The aim of all the German measures is also to establish a legal framework for the creation of a nationwide infrastructure for spatial information. The core of the regulations discussed is constituted explicitly by the rules for creation and using data,59 metadata,60 and spatial data services,61 and providing technical and legal conditions in the subjective and objective scope.

German Federal Acts62 as well as GeoZG-NRW63 stress the special role of environmental protection in using spatial data and services.64 The Polish and Ba-

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56 Compliant with the requirements of Art. 24(1) sentence 2, all such legislation must include a proper reference to the Directive.
57 The use of the term „the usufruct of the infrastructure for spatial information” is another confirmation that the language of the law is not adjusted to the legislative needs in the scope of the new technologies, resulting in loaning terminology from property law (cf. art. 252 of the Civil Code). A better solution would seem to be to use the term “benefit” instead of “usufruct”.
58 Cf. Art. 1 u.i.i.p.
59 Based on the regime of the INSPIRE Directive and some implementing Acts, the whole sets of data, and not individual pieces, are made available (cf. footnote 4). The data sets are understood to be an identifiable collection of spatial data (cf. art. 3 para. 11, as well as art. 3 para. 3 of the INSPIRE Directive). Other acts (for example, GeoZG) refer their access regulations directly to spatial data, e.g. §4 GeoZG;
60 This is understood as meaning information describing spatial data sets and spatial data services, enabling searching, cataloguing, and using the data and services (art. 3 item 4 u.i.i.p.).
61 These services are understood to mean operations which may be executed on computer software on the data in the spatial data sets or their metadata (cf. art. 3 item 10 u.i.i.p.).
62 §1 II GeoZG.
63 §1 GeoZG NRW.
64 This group includes the Acts of the following Länder: Saxony (§1 SächsGDIG), Hamburg (§ 1 I Hamburg- HmbGDIG), Baden-Württemberg (§ 1 II Baden-Württemberg- LGeoZG),
varian acts do not differentiate in this aspect of scope. The aim of the act of Lower Saxony it to make interoperable spatial data available, while the goals of Saxony-Anhalt legislation is to develop and maintain the infrastructure for spatial information of the Land as a part of German-wide infrastructure. While, for example the Act adopted in the Rhineland-Palatinate contains a much more extended formula, emphasising especially not merely the aims of environmental protection but also broadly understood “public service”, public administration, and the economy. Hesse’s Act regulating both matters of geodesy and geoinformation is of note in this context: besides the aims already mentioned, it adds public security, the country’s defences and protection of nature. Geodesy and geoinformation is also regarded as fostering development of the Federation and securing land ownership. Brandenburg’s Act’s objective is also to provide high quality data quickly for scientific purposes.

However, these differences are mostly of a political character and will not be important during the process of sharing spatial data.

Most of the definitions included in INSPIRE were reproduced in the implementing legislation in a similar form. U.i.i.p., GeoZG, and BayGDIG simply copy the definition of spatial data from the INSPIRE Directive, describing them as all data directly or indirectly referring to a specific location or geographical area. GeoZG NRW eliminates the adjective “all”. It does not change, however, the semantic scope of this definition.

Unlike u.i.i.p. (art. 3 item 11 u.i.i.p.) none of the German legislation implementing the INSPIRE Directive under discussion contains a definition of, or uses the term, spatial data sets, invoking only on the notion of spatial data and in each case replacing the directive’s term “spatial data sets” with the term “spatial data”. An illustration of this is the case of metadata. It is why INSPIRE describes metadata in art. Art. 3 para. 6 as information describing spatial data sets and making

North Rhine-Westphalia(§ 1 II North Rhine-Westphalia GeoZG NRW), Bremen (§ 1 II Bremen - BremGeoZG).

65 Cf. also Acts implementing the INSPIRE Directive in the following Lands: Saarland (§1 Sara-SGDIG), Berlin (§1 Berlin- GeoZG Bln), and Schleswig-Holstein (§ 1 Schleswig-Holstein- GDIG).

66 § 1 Lower Saxony – NGDIG.

67 § 1 Saxony-Anhalt – GDIG LSA. The same objective for the infrastructure is predicated by Thuringia (§ 1 Thuringia – ThürGDIG) and Mecklenburg-Western Pomerania – GeoVermG M-V (§ 7) in spite of the fact that in general the objectives for geoinformation and geodesy are regulated in this legislation in a similar way to the solution accepted in Hesse (cf. footnote 61).

68 § 1 Rhineland-Palatinate LGDIG.

69 § 1 Hesse – HVGG.

70 § 1 ust. 2 Brandenburg – BbgGDIG.

71 Cf. footnote 4.
it possible to discover them, make an inventory of them, and use them, while GeoZG and GeoZG NRW describes it as information describing spatial data or spatial data services, leaving the rest of the definition unchanged. BayGDIG adds to the definition of the metadata such Network Services which may be described by them. The definitions of both spatial data and spatial data sets are so broad and imprecise that, in practice, it seems that the differences discussed do not matter.

The acts implementing the Directive at the federal level contain more diverse definitions of the spatial data services. The INSPIRE Directive in Art. 3(4) defines them as operations which may be performed, by invoking a computer application, on the spatial data contained in spatial data sets or on the related metadata. A similar definition is found in u.i.i.p. (art. 3 item 10 u.i.i.p.) using the term “software” instead of “application”. As regards the German legislation, despite shunning the term “spatial data sets”, it provides: “spatial data services are connectable applications which in a structured form make spatial data and metadata available, creating a closed catalogue comprising services of discovery, viewing, downloading, and transforming”. In this fashion they merge the spatial data services with the network services which are mentioned in Art. 11(1) items 1-4 of the INSPIRE Directive with the spatial data services from Chapter 4 u.i.i.p. BayGDIG mentions all five network services, including these which allow spatial data services. Additionally, all of the German legislation defines network services as network-based applications used for communication, transactions, and interaction, while INSPIRE uses this term without defining it and characterising it in Art. 11. The fifth of the network services of Art. 11(1) INSPIRE not listed in §3 III of either GeoZG or GeoZG NRW is comprised in the statutory definition of network services – for example, internet payments. U.i.i.p. does not use the term network services at all. Access to all five kinds of service is provided by the administrative bodies which maintain adequate public registers pursuant to art. 9 sec. 1 u.i.i.p. This example invites the observation that the differences in the implementation of the INSPIRE Directive are mostly issues of legislative technique, and the availability of the services assured by the Directive is provided for in the national legislation.

The interoperability of spatial data, spatial data services, and metadata is one of the major premises of the legislation under discussion. Without it, one could not make use of all the advantages from the infrastructure for spatial information; hence it is explicitly guaranteed by the provisions of art. 7 u.i.i.p., §8 GeoZG, §8 GeoZG NRW and art. 8 1 BayGDIG.

Another key term used in the INSPIRE Directive and the implementing regulations is the infrastructure for spatial information.72 The infrastructures are cre-

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72 In the sense of art. 3 item 2 u.i.i.p. it means spatial data sets and relevant services described by metadata, technical means, processes and procedures which are applied and made
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ated on the national and European levels. The definitions, despite not being identical, agree in semantic scope in all the legal measures considered here.

The INSPIRE Directive and all of the German legislation include the explanation of the term “Geoportal”. INSPIRE defines this notion as a web site or an equivalent, while the German Acts invoke a wider notion – a platform for communication, transaction, and interaction. U.i.i.p. uses the most general definition of a “central point of access to spatial data services”. All of the legal measures discussed stipulate the objective of the geoportal as providing access to spatial data services. The Acts mention both spatial data services and network services, while the Directive focuses only on network services within the purview of Art. 11(1). This theoretical discrepancy is smoothed out by the fact that the statutory catalogues of spatial data services also include network services.

None of the German Acts explain or use the term “spatial object” elaborated in Art. 3(5) INSPIRE and art. 3 sec. 5 u.i.i.p.73

Contrastingly, all of the legislation deploys the notion of a third party, but this is only defined in the Directive and u.i.i.p. The latter adjusts the definition to the context of Polish law and the existence of so-called “organizational units granted legal capacity”.74

Summing up, it can be claimed that the existing differences in the definitional scope either stem from the chosen legislative technique or are an effect of adjusting to a particular legal system. In practice, they do not play an important role (but rather an auxiliary role in the interpretation of other laws); they do not have an adverse impact on the implementation of the INSPIRE Directive, and thus they do not amount to a transgression of the obligations the Directive entails.

7. Objective and subjective scope

The INSPIRE Directive is directed to all Member States. Each Act refers to the territory of its application and relates to the appropriate public authorities.

In place of the term “public authorities” defined in the directive (Art. 3(9) INSPIRE), GeoZG in §3 VIII uses the term “an institution handling spatial data” (geodatenhaltende Stelle). According to §2 GeoZG, this term is applicable in relation to the federal institutions that handle spatial data (or legal entities of public law directly dependent on the Federation). These entities should be understood as institutions obliged to provide information which are mentioned in the Federal En-

available by the leading organs, other administrative bodies, and third parties co-creating the infrastructure for spatial information.

73 It is an abstract representation of a real-world phenomenon related to a specific location or geographical area.

74 Cf. art. 33° of the Civil Code.

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environmental Information Access Act of 22 December 2004 (UIG) (which mention additionally emphasises the connection between these Acts), that is to say, governmental administrative units and other institutions of Federal public administration. The advisory committees of these institutions are considered to be included provided they appoint their members. The highest Federal agencies are not obliged to furnish information, provided that they do not participate in the law-making process or in issuing directives; the same holds for courts not performing tasks of public administration. The institutions obliged to provide information include natural persons and legal entities constituted under private law, if they fulfil public tasks or provide services related to the environment. Furthermore, natural persons and private law entities are subject to the GeoZG regulation, if they provide spatial data and spatial data services, and metadata by means of the national infrastructure for spatial data.

GeoZG NRW also refers to the definition of an institution handling spatial data in the NRW Environmental Information Access Act.75 By contrast, BayGDIG, like the Directive, uses the term Behörde (that is, a public body or agency). In accordance with the substance of art. 1 II of the Bavarian Administrative Procedure Act,76 an agency is any unit which fulfils public tasks. That encompasses public and legal administrative activities of Bavarian agencies, districts and their unions, and other legal entities of public law controlled by the Bavarian Land, save in so far as specific laws provide otherwise. Bavarian BayGDIG also refers to public advisory committees for the institutions just mentioned, and natural persons and legal entities constituted under private law if they perform tasks connected to the natural environment or provide public services (art. 2 II item 2 BayGDIG). The precision in building such definitions is crucial since the person on whom a duty is imposed, is identified on their basis.

Polish u.i.i.p. refers to an administrative body77 which keeps public records78 as a subject responsible for enabling and providing access to discovery, viewing, and downloading services (cf. art. 9 sec. 1 u.i.i.p.).

The regulations’ data, which are applicable by virtue of the Directive, and the implementing regulations are very close. The Regulations state that the data

75 § 1 II North Rhine-Westphalia – UIG NRW.
76 Bayerisches Verwaltungsverfahrensgesetz (BayVwVfG), BayRS II, p. 213.
77 In the sense of art. 5 §2 item 3 KPA (Code of Administrative Procedure): the Ministers, central bodies of governmental administration, provincial governors, other district and local government bodies, and other government bodies and subjects established by the law or by agreement to resolving individual cases in the chain of administrative decision-making. In the sense of u.i.i.p., public organs also include other subjects established by the law or authorized by agreements concerned with the fulfilment of environmental public tasks.
78 Art. 3 item 5 u.i.d.p. refers to a register, records, list, or other forms of registration, used for fulfilling public tasks, and kept by a public subject in accordance with separate legislation.
must at the same time refer to the territory of its control and be in an electronic form.\textsuperscript{79} The data have to be at the authorised public authority body’s disposal, and the data have to be within the scope of the body’s public activities (though only when the data was produced, obtained or managed and updated), or at the disposal of a third party authorised to connect to the national infrastructure of spatial data, after having satisfied the relevant requirements. Spatial data have to refer to at least one of the 34 themes included in Annexes I-III of the INSPIRE Directive and mostly mentioned in the annexes to the implementing regulations. If need be, the details of the specification of each of the themes will be included in the executive measures.

The implementing regulations are presently in force only as regards the spatial data services related to the spatial data mentioned above. The extension of this catalogue is not a problem from the legal point of view.

The regulations in question are applicable only to the referential versions of spatial data. This means that if different institutions ordering spatial data possess a number of identical copies of the same spatial data, or the copies are stored in such an institution, the regulations are applicable only to the mother version, of which other copies were created. Each change or update of a copy renders a new spatial data, being, as of the moment of introducing the change, a separate referential version. The institution which introduced the changes is held responsible for this copy.

8. Restrictions of access to spatial data

The general approach of the drafters of the Directive and the Acts discussed has been to make access to spatial data as wide as possible in the European Community (EC), for the most favourable prices. However, data processing is expensive, and a limitless access to them may cause certain dangers. That is why there are some exceptions limiting the general approach. It is understandable that if spatial data are made accessible only in the viewing service, it has to be done in a way that disables the commercial reuse of the data.

All of the legislation discussed predict an eventuality of limiting public access to spatial data services via the view services, when such access could have an adverse impact on international relations, essential protected interests of public safety, or national defence.\textsuperscript{80} This limitation was introduced, for example, to prevent obtaining information about the location of Navy vessels, often used for providing weather information. In this case, as in every other situation discussed, only

\textsuperscript{79} The correct term would be „of electronic character” (cf. footnote 34).
\textsuperscript{80} §12 sec.1 GeoZG and art. 11 sec. 1 u.i.i.p.
a justified suspicion that granting access could be detrimental to at least one of the higher ranking protected interests is sufficient to restrict access. The remaining services (discovery, downloading, transformation, and e-commerce services), in addition to the three risks mentioned above, may constitute an additional threat to one or more interests listed below. Unlike u.i.i.p., both GeoZG and GeoZG NRW refer to §8 sec. 1 and §9 of the Access to Environmental Information Act (UIG). In addition to the interests mentioned, the following are also protected:

1) confidentiality of the activities of public authorities
2) conduct of ongoing court proceedings
3) the right of a person to a fair trial
4) conducting investigation into a criminal or regulatory offence
5) the environment
6) human health and security
7) cultural objects and buildings
8) personal data
9) intellectual property
10) confidentiality of commercial and industrial information
11) maintaining the confidentiality of statistical data and tax secrecy.

On account of the access to spatial data and spatial data services, there may be a requirement for money consideration and licensing (assuming specific regulations make the appropriate provisions). There is no money consideration for the discovery services. Generally, this embraces also the discovery services as such, since these are to be publicly accessible free-of-charge, provided they are in the form of a network-connected screen representation. (There is, however, a possibility to depart from this rule– for example in the reference to frequently updated data. Had it not been for such a provision, all weather information would have lost its market value because of the obligation to permit access free-of-charge.) The institution holding spatial data is responsible for limiting it for commercial use. If there is no technological possibility to introduce such measures of security, that fact cannot be a basis for introducing fees for access to this type of data: what is more, it cannot constitute grounds for denying access to such data.

The institutions holding spatial data are also responsible for accepting payments for the services via the internet. If there is no possibility of using ePayment services, the institution does not have the right to collect charges and, in that even, it has to allow others to benefit from access free-of-charge to the data. The inability to introduce internet payments is also not a basis for limiting the access to spatial data. Thus the risk lies directly with the agencies concerned. There is a possibility of concluding various licence agreements providing a full access to spatial data sets. This issue has not been precisely regulated yet.
9. Summary

Ensuring the possibility of common access to spatial data and services creates new prospects for economic development and helps build the information society. For without reliable, precise, and up-to-date information, the realization of these goals is unlikely. The INSPIRE Directive seems to meet these requirements, but the legal basis for issuing the Directive itself is questionable.

Spatial information is one of many kinds of information regulated by special provisions. The semantic scope of spatial data is so universal that it is problematic to separate it from other kinds of information such as public information or environmental information. The element that stands out is the manner of making spatial data accessible – the infrastructure for spatial information.

The legislation implementing the INSPIRE Directive in the national legal systems are of similar content. There are some differences in the transposition concerning, for example, the definitional scope, and are a result of the choice of legislative technique or adjustment to the characteristics of a given legal system. The differences do not limit the scope of the legislation or access to spatial data in an unjustified way. Thus they do not have an adverse impact on the correctness of the implementation of the INSPIRE Directive; they do not amount to infringements of the EU obligation to effect its proper transposition.

The existing legal language does not seem to be suited to modern “information law”, since it borrows fixed terms from the property law without defining them uniformly or disentangling them from their common meanings.

Legal acts

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<tr>
<td>AGeoDIG</td>
<td>Bundesgesetz, zur Schaffung einer Geodateninfrastruktur des Bundes; No.: GP XXIV RV 400 AB 590 p. 53. BR: 8276 AB 8279 p. 781, CELEX-No. 32007L0002</td>
<td>Austrian Federal Act: Federal act creating the infrastructure for spatial data of the Federation.</td>
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### Abbreviation | Title | Comments
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Code de l’environnement | Code de l’environnement | In France, the INSPIRE Directive was implemented by the changes introduced to the French Environmental Code by Ordonnance No. 2010-1232 of 21.10.2010.


Chapter V. Implementation of the INSPIRE Directive...

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<td>GeoZG</td>
<td>Gesetz über den Zugang zu digitalen Geodaten (BGBl. I p.278)</td>
<td>German Federal Act: Access to Digital Spatial Data Act (BGBl. I S. 278)</td>
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<tr>
<td>Hesse – HVGG</td>
<td>Hessisches Gesetz über das öffentliche Vermessungs- und Geoinformationswesen (Hessisches Vermessungs- und Geoinformationsgesetz – HVGG) of 6.9.2007, GVBl. I 2007, 548</td>
<td>Act implementing the INSPIRE Directive in Hesse. This Act regulates both the geodetic matter and access to spatial information</td>
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### Abbreviation | Title | Comments
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North Rhine-Westphalia GeoZG NRW | Gesetz über den Zugang zu digitalen Geodaten Nordrhein-Westfalen (Geodatenzugangsgesetz – GeoZG NRW) of 17.2.2009, GV. NRW. p. 84 | Act implementing the INSPIRE Directive in North Rhine-Westphalia  
### Chapter V. Implementation of the INSPIRE Directive...

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<td>Thuringia – ThürGDIG</td>
<td>Thüringer Geodateninfrastrukturgesetz (ThürGDIG) of 8.7.2009, GVBl. 2009, 574</td>
<td>Act implementing the INSPIRE Directive in Thuringia</td>
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Chapter VI. Geospatial Information: Enduring Contractual Issues

1. Introduction

Geographic information systems (GIS) are useful tools that help many people from scientists to citizens resolve the many geographical problems that arise on a daily basis. These could be complex issues of computing locational problems in the environment, through to scheduling and logistics in transport planning or simply to finding the address of the nearest after hours chemist. To resolve such problems the expert as well as the novice user will rely on the systems that drive the application that itself are underlain by data, methods, technology and services that have been developed over time. Any good text will chronicle the development of GIS since its inception in the 1960s as an extension to the “quantitative revolution” in geography. During the initial decade of GIS the production of automated mapping and its concomitant reports were foremost in the minds of most users. The developmental stage saw the production of many “geographical” products by individuals, teams, consultants and service bureaus. Then after the full flush of early adoption, users had to grapple with both products and the services because some were only interested in the products whilst others in the services. But inevitably both camps have had to address “access” issues with providers and to tackle head-on with issues of a legal nature, namely that of contract and liability law. In launching projects requiring geospatial information (GI), the excitement and enthusiasm to try new technologies, software and techniques, users sometimes overlooked considerations of law and what it may require. The gravity of this requirement sometimes only surfaced when there is a “problem” and invariably one of a contractual nature with all its liabilities and implications.

Contractual issues are multifaceted and prismatic especially in relation to geospatial information (GI) products and services. These GI products and services sometimes meld inconspicuously into one another and make it difficult to identify each element individually. Hence it may be vital for geospatial analysts and practitioners to recognise the respective roles of information providers, software consultants and end users of information systems on the one hand and the software, technical support and other services on the other. Due diligence suggests that a sound understanding of contract law will go a long way to good business
practice to ensure effective business relationships. A modern view of contract law and practice should be one aimed at “relationship-building” rather than one that drives a hard bargain, to foreshadow conflicts or to get out of disputes. For many businesses long-term relationships ensure greater effectiveness for both parties since they will have to depend on each other for their mutual benefit. For private firms and government business agencies alike, the need is to be proactive and to anticipate likely legal problems ahead. This implies that there should be a shift in focus from the breakdown in relationships to one that recognises the real nature of those elements that make for successful contracts and to strive to use the best characteristics of these elements in every agreement.

New developments in the delivery of GI, storage, and analysis have transformed the nature of the workflow. The shift in paradigm is one that is wholly digital to one that is from the desktop to one that is virtual in the ‘cloud’. Cloud computing (CC) has opened up a new vista in spatial computing and geospatial analytics as users can access these resources from anywhere, at any time and share these with everyone. In addition with the introduction of crowd-sourced mapping techniques the volunteer and the crowd add to the complexity of contractual relationships.

This chapter attempts to highlight contractual issues arising from the use of GIS and more importantly to arrive at an understanding of the distinctions that will inevitably be asked by the courts and legal decision makers of fundamental questions. These fundamental legal questions are generated by the nature of the technology, for example, geographic information systems and geographic information services; and whether the GIS produces a product or a service; and whether a GIS provider is a contractor or employee. Embedded in each of these are legal theories grounded in the initial agreement of a provider and a user of the GIS. The technology has changed from being simply geographic information systems to include geographic information services. An understanding of the law of contract is of critical importance to the legal management of transactions and obligations in engaging GIS technology and services. But, there is a need to tease out these contractual issues and to provide a way point for the unwary especially in the digital environment and the use of the Internet to deliver GI products and services.

In the next section the law of contract is given in a “nutshell” to introduce and explain some of the more common legal terms and nomenclature in use. Then in Part three the GI product-service dichotomy is discussed to help resolve legal dilemmas and disputes that have gone to court. Part four is intended to emphasise the personnel issue where contracts of service and contracts for service may result in questions about ownership of products, the delivery of services and the combination of both. In Part five newly emerging contractual issues is discussed with the evolution of the Web 2.0 environment facilitating cloud computing, geospatial

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computing and spatial analytics. Added to this mix is volunteered geographic information (VGI) contributed by the “crowd” that could seriously challenge traditional ways of sourcing geospatial information. The final Part six looks to the future legal and policy developments where a global framework for setting rules, monitoring and policing performance is proposed.

2. The Law of Contract in a Nutshell

The Law of Contract as it relates to both civil law and common law traditions is essentially similar with the objective of spelling out the rights and responsibilities of both parties to a legally binding agreement. Traditional law of contract may be discussed in terms of a “meeting of the minds” where an offer is accepted and sealed with some sort of consideration. In law, contracts signify that an agreement has been reached and is strong indicia that two or more parties intend it to be binding in a legal manner – the so-called intention to create legal relations. This means all parties to the contract agree to be bound to the agreement. Well-drafted contracts may help avoid problems in the execution of the contract as it may be quite expensive for court litigation. The legal incidents of a legal contract include situations where there may be a breakdown of relationships and there is no performance leading to a breach of the contract. Under such circumstances each of the elements leading to the breakdown need to be identified so that there may be some form of restitution and damages (like compensation) payable for loss suffered by one party due to the non-performance by the other party or simply a rescission of the contract.

The intention of this section is to provide a brief outline of important elements in the law of contract and where necessary highlight differences emanating either from the civil or common law traditions. A further reason is to provide a familiarity to the various legal terms and nomenclature used in relation to agreements for GIS products and services. Some readers may wish to skip this section entirely if it is peripheral to their needs and is of little interest.

*Offer and acceptance.* Agreement is the first essential element in the formation of any contract. A binding agreement involves a consensus of two parties with an offer made by one and accepted by the other and a contract is achieved by the communication of an offer. An offer is one made by one party to another under which the offeror is to be bound by the contract and there is nothing left to negotiate.

*Intention.* An intention to be legally bound is the next element as a contract does not come into existence unless the parties wish to enter into a legal relationship and be legally bound by it. The intention of a party might be expressed or implied by their conduct. In relation to implied intention domestic, social and family agreements do not contemplate legal enforceability.
Chapter VI. Geospatial Information: Enduring Contractual Issues

Consideration. A consideration is required in simple contracts which may be made orally or in writing or a combination of both. Consideration can be a promise by one party and is the price for which the promise of the other is bought. This promise is given for value and is thus enforceable. Consideration is something of value bargained for and may take the form of an act for a promise, a promise for an act, a promise of a promise and a promise not to do something. There are rules for consideration and different kinds of consideration.

Writing. This is not an essential element of a simple contract unless it is required by statute. Hence, at common law a contract can be wholly oral, partly oral and partly written, or wholly written although there are legislative exceptions to this general rule.

Contents. With the coming into existence of a contract, the contents of the contract may identify and spell out the obligations and rights of each contracting party. This involves determining the terms of the contract and the meaning of each of those particular terms. However, a distinction is to be made of pre-contractual statements either as “mere puffs” or representations; or become contractual terms. Puffs have no legal effect whereas representations provide legal remedies where these were found to be fraudulent, innocent or negligent misrepresentations. A contractual term attracts remedies depending on whether the term was a condition, warranty or intermediate term. Whether a statement is a representation or a contractual term depends on the objective intention of the parties.

Parties. The law places some limits on the ability or capacity of some classes of persons to enter into a contract, for example, minors and mentally challenged people. Under the doctrine of “privity of contract” in a majority of situations the parties to the contract will consist of the promisor and promisee who acquire rights and liabilities under the contract. Third parties are not privy to the contract but may accumulate rights under a contract.

Mistake. Mistake may operate to show that the parties did not genuinely consent to the formation of a contract. However, given the subjective nature of this doctrine, courts are reluctant to grant a party relief on the ground of mistake. An operative mistake may be one of fact or law. A common mistake may occur when both parties enter into a contract under some mistaken belief that a certain situation exists or that a relevant fact is correct. A common mistake will render the contract void at common law if the mistake is fundamental. A mutual mistake occurs when both parties to a contract are at cross-purposes as to the subject matter so that there is no consensus and consequently there is no agreement between the parties. The contract is void because the parties have not reached an agreement about the same subject matter.

Misrepresentation. A misrepresentation is an untrue statement that has induced the other party to enter the contract. This statement could be made either
before or at the time of entering the contract. A finding of misrepresentation renders the agreement voidable at the option of the representee. Misrepresentations may be fraudulent and deliberate or may be negligent where the representor owes a duty of care to a representee and acted carelessly in making the statement.

Unconscionability. Unconscionability as a vitiating factor includes duress, undue influence and unconscionable conduct. These factors demonstrate that the parties did not wholly consent to the formation of a contract.

Illegality. The law may invalidate a contract that it considers has an unlawful or improper purpose. A court would not allow a party to base a cause of action upon an illegal act and the court may declare a contract illegal or void or unenforceable.

Discharge. Discharge relates to the process of bringing a valid and enforceable contract to an end. The contract may be discharged by performance of the contract, agreement between the parties, breach of the contract, operation of the law or a frustrating event.

Remedies. Damages are the traditional remedy for an innocent party who is the victim of a breach of a valid contract by the other party. The purpose here is to compensate the innocent party for the loss sustained because of the breach and not to punish the other party. The assessment of damages is based on whether there was a causal connection between the innocent party’s loss and the other party’s breach; and whether the loss was too remote, that is, reasonably foreseeable.

Discussion

The principles of the law of contract that operate in all jurisdictions have nuances and differences that are particular to the country’s legal tradition. Internationally, recent reforms established by the United Nations (UN) such as the UNIDROIT Principles of International Contracts\(^1\) and the UN Convention on Contracts for the International Sale of Goods (Vienna Convention)\(^2\) have been adopted by many jurisdictions. Supra-national agglomerations such as the European Union’s (EU) Principles of European Contract Law (PECL)\(^3\) have been passed in order to achieve some level of harmonisation of rules of civil and common law with international and European rules and standards.

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Chapter VI. Geospatial Information: Enduring Contractual Issues

As an exercise in international comparative law it might be useful to examine a case study of an EU country and briefly discuss contract law there. Poland has a well-established legal tradition and has codified its civil law. The Polish legal system is similar to many countries of Western Europe but there are some differences in contract law.\(^4\) The general rules of Polish contract law are set out in the Civil Code under obligations in particular contract, torts and unjust enrichment.

The key rule of Polish law of obligations is the freedom of agreements under Article 353\(^1\) of the Polish Civil Code. Parties to a contract may shape their legal relationships at their discretion, provided that its content or goal is not in conflict with the nature of the relationship, the law or the principles of social coexistence.\(^5\)

Unlike English law, Polish contract law provides for two additional means of offer and acceptance, namely negotiations and auction (either orally or in writing).\(^6\) Polish law does not provide for the postal rule found in English law where an offer is considered made when it reaches the addressee in a way that enables reading it.

The Polish Civil Code provides for specific rules concerning executing contracts via electronic means of communication. Polish law does not require any of the parties to give the other party any consideration – only two statements of will to enter the contract and a description of essential conditions. So a contract of sale has to include the seller's obligation to transfer the title and possession of the item and the buyer's obligation to collect the item and the indication of the price. Parties are free to choose the governing law so long as there remains some connection between the contract and the country in which it applies.

Similar to English law, under Polish law there are two methods for ending a contract by one of the parties – termination and rescission. Termination is usually provided for in contracts but some provisions of the Civil Code give a right to terminate a contract that cannot be waived. Rescission results in the contract being nullified from the very beginning preventing it being executed. There are also provisions permitting a party to rescind the contract in order to protect them from entering a complicated contract that they do not fully understand, for example, insurance contracts, contracts executed by phone or the Internet.

Unlike English law, Polish law does not provide for a distinction between liquidated damage clauses and penalty clauses. Under English law, liquidated dam-

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ages are enforceable while penalty clauses are null and void. Under Polish law, even the severest penalty clauses are valid, albeit Courts may lower it.

There has been a gradual harmonisation of Policy civil law with European rules and standards and the UN. Poland is a party to the Vienna Convention noted previously so that it will bind companies in countries subject to the Convention. Also there has been the implementation of all EU Directives concerning the various institutions and rules of private law over time. However, only a few Directives have been integrated into the Civil Code. The majority have been implemented outside the Civil Code either by way of enactment of specific statutes or through introducing their rules into existing special enactment. The EU Directive Concerning Liability for Defective Products (85/374/EEC) is included in the provisions on obligations in the Civil Code on delictual and on contractual liability. The Council Directive on Unfair Terms in Consumer Contracts (93/13/EEC) is implemented in the Civil Code on general provisions concerning contractual obligations.\(^7\) In the bid to implement EU Directives the set of regulations have been fragmentary and internally non-harmonised laws which may lack a coherent legal framework. A proper evaluation of the impact of harmonisation of the laws on Polish law is absent. It is arguable that the harmonisation of local laws with EU Directives and UN Conventions has played an important role in the modernisation of Polish civil law.\(^8\)

The legal taster above on the general law of contract and its requirements together with the brief comparative law exercise from Poland a Civil Code country demonstrates that there may be some harmony in the rights and obligations of producers and providers. Two abiding concerns that have been raised include those of geospatial information products and services and the “status” of the service providers either as employers or employees. These themes are the subjects of the following two sections.

### 3. Geospatial Information: Products and Services

Geospatial information tools deliver both products and services. The sale of products and goods requires different contractual terms to those that offer services to the public at large. Contracts are both necessary and sufficient conditions for business efficacy for persons and agencies seeking to offer GI services or products. However, at various stages before any agreement and before contracts are

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\(^7\) These are found in Title XIII of Book Three of the Civil Code. See J. Rajski, European Initiatives and Reform of Civil Law in Poland, 2008, at http://www.juridicainternational.eu/?id=12714 as of 28 January 2014.

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A person or agency may need to explore the nature of the product or service that is contemplated through:

- Request for information (RFI)
- Request for proposals (RFP)
- Provision of programming services and/or licensing and leasing of software
- Maintenance of databases, data collection, data analysis and reporting
- Developing a geospatial information system
- Outsourcing of mapping functions including the collection, storage and dissemination
- Delivery of mapping services through mobile devices and on the Internet.

Geospatial analyses using GIS has since its inception been the provision of products rather than one of services, even though the latter may also be contemplated. GIS analyses include maps and written reports and the accompanying recommendations and expert opinion on the problem at hand whether these concern environmental, logistical or merely database management issues. A common feature of commissioned works is that one party can expect a document or series of documents providing both analyses as well as strategies to assist in the decision-making process. In doing so, there is an implied warranty of some form. That warranty would include the fact that the task was undertaken with all due diligence, skill and care and that the final product was delivered in a workmanlike, professional manner. Furthermore, it is implied that the work was executed and that the materials supplied are of good quality and fit for the purpose for which they are given.

With geospatial information analysis as a service some form of indemnity and exclusion from legal liability is usually written into the contract. These exclusions, of necessity, may include terms that avoid or limit liability arising from negligence and the subsequent damage and loss arising as a result. However, if the contract consists of geospatial information services tort liability arising from negligence may arise. This involves a duty of care, the breach of the duty of care, causation or proximate cause, and damages. Contractual liability is more limited and narrower in scope because of the privity requirement.

Where the geospatial information contract was for the provision of software – the mapping system itself, there may be difficulties in distinguishing between the supply of goods (products) and / or the provision of services. For example, in the UK the Sale of Goods Act 1979 (UK) relates to goods alone whereas the Supply of Goods and Services Act 1982 (UK) relates to both goods and services. But, in these two Acts there is an implied condition that the goods will be reasonably fit for the purpose for which they were intended and that they were of “merchantable quality”. For the provision of services, it is implied that these were performed with reasonable skill, care, and in a timely manner. The interpretation of the Acts,
whether it was a supply of products or services, would depend largely on the particular facts of the case.

In the US contracts for the sale of goods are subject to Article 2 of the Uniform Commercial Code (UCC) which generally applies to all goods offered for sale in interstate commerce. Most states have adopted this code either in its entirety or large parts of it. If there is no explicit contract between the supplier of goods and a consumer, then the provisions of Article 2 applies to the sales relationship. Geospatial information software, hardware, and datasets are classed as “goods or products” and hence the transaction is subject to UCC provisions.

In Australia, the New South Wales (NSW) Supreme Court considered the supply of both software and hardware as a sale of goods. In *Toby Constructions Products Pty. Ltd. v Computa Bar (Sales) Pty. Ltd.*\(^9\) the court held that the sale and installation of software and hardware and the training of the purchaser’s staff constituted a sale of goods. The judge stated that the “system, software included, whilst representing the fruits of much research and work, was in current jargon off-the-shelf, in a sense mass-produced”. Similarly, an English court in *Micron Computer Systems Ltd. v Wang (UK) Ltd.*\(^10\) has treated the supply of a computer system, comprising both the hardware and software, as a sale of goods.

An English court in *St Albans City and District Council v International Computers Ltd.*\(^11\) considered the development of a computer package for a consortium of local authorities to be used for calculating and administering the community charge (poll tax). In implementing the package, the software contained an error and St Albans suffered a loss of revenue because of this error. The judge in the case held that International Computers Ltd. was liable for the loss because it was in breach of its obligations under the contract to supply software to help calculate the figures correctly, and it was held that the company was in breach of its obligations to provide a service with due diligence.

The underlying facts of each case noted above might suggest whether a product or a service or even both products and services are dependent on the facts of the case and what is contemplated in the contract itself.\(^12\) Hence, in the sale of geospatial information databases, it may be necessary to specify the nature of the data product as completely as possible. This will mean specifying as far as pos-

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\(^9\) [1983] 2 NSWLR 48 per Rogers J at p. 51.

\(^10\) Unreported 9\(^{th}\) May 1990 (QBD).


\(^12\) See also a comparative discussion of the different jurisdictions throughout the common law world in Commerce Clearing House Inc. (CCH) 1992 *Guide to Computer Law*, ‘Computer hardware and software as goods’ (CCH ¶7120), ‘Hybrid transactions: Contracts including system support services’ (CCH ¶7140); and ‘Time-sharing and service bureau contracts’ (CCH ¶7160).
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sible what the data were collected for, what the data have been used for, what the
data may be unsuitable for, and what is the coverage of the data set. Specifications
will be necessary in order to ensure that the buyer knows what they are buying and
what types of warranties are being given.

The benefits of a contract for geospatial information products and services are
obvious in that they may contain a comprehensive set of factors including testing,
maintenance, support, finance, warranty and liability. Licences, warranties and
indemnities are contractual devices for both geospatial information software and
hardware. These are used as a “shield” – a protective measure to minimise con-
tractual liability risks. Apart from a contractual relationship, if the right wording
is used in a disclaimer, the risks of liability can generally be either minimised or
averted altogether. However, such liability in contract must be qualified in that
the liability risk relates only to economic loss and not generally to personal injury
or wrongful death – the latter clearly under the purview of tort law. The maxim
caveat emptor – “buyer beware” is always relevant, as is the element of using pro-
fessional judgement when evaluating the information.

It is suggested that an initial analysis of liability be undertaken by original de-
signers and programmers to decide whether the risk of potential liability is in fact
reasonable or whether it is outweighed by other considerations. Such an analysis
would also highlight whether a contract or disclaimer is appropriate to address the
capabilities and potential shortcomings of the system.13

The question of contractual liability needs to be addressed in the case where
a public body is given the responsibility by statute to provide data and informa-
tion to interested parties. In the US for example, anyone can obtain information
under the so-called Open Records laws. These records are collected and kept by
government agencies funded through the tax system. The question that arises is
whether these government agencies can be held to be liable for incorrect infor-
mation provided pursuant to a request under the Open Records regime? For the
government agency concerned by simply providing the information as required
under the relevant statute, there is no implication that the information is accurate
and correct and that the user could rely on the information. The information is
supplied “as is” with all care taken in its preparation and no responsibility for its
subsequent use; is not sold but given to requesters other than the cost of the media
to transmit the information, and with no guarantee to its integrity, accuracy and
source provenance.

The theme of producing geospatial products or services has raised some in-
teresting legal issues and is closely related to the next the theme relating to the

13 E. Epstein & H. Roitman, Liability for information, Papers, Annual Conference of the

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distinctions between employers and employees and their mutual relationships. In deploying GIS the nature of the contractual relationship contemplated is often raised. The homomorphic sounding contracts of service and contract for service could seem enigmatic but on closer inspection may prove not to be the case. This is discussed next.

4. Contract of Service and Contract for Service

Here a distinction needs to be made between a contract of service and a contract for service. The distinction is between an employee and a consultant each attracting different legal entitlements and responsibilities.

This distinction is an important one under the common law. The distinction between a contract of service and a contract for service is concerned with the hiring of personnel either as an employee or of an independent consultant. An employment contract is one under which the employer has the right to directly control the services of the employee. In an employment contract, the employer has the vested right to give directions as to the manner of performance of the work, the ownership of the products produced and the intangibles including intellectual property rights (IPR). On the other hand, an independent contractor or consultant may contract for a result. Such a result may eventuate in a product or the performance of an activity. The contractor or consultant may not agree to accept the directions of the employer as to the execution of the work. Hence the distinction is made where the consultant performs “for service” as opposed to an employment contract where it is one “of service”.

Many personnel contracts are about the performance of services over a set period of time that may or may not be renewed. The maintenance of GIS appears to produce few contentious issues. Hiring someone to develop computer software may produce several legal implications relating to ownership and maintenance.

The consultant / contractor may well wish to contract on a time-limited basis in order to avoid being committed to the performance of a particular task. There may also be the prospect of a fixed fee and a limit as to the risks that the contractor may wish to be exposed to. In such cases the customer needs to scrutinise the contract carefully to discover what is being promised. Even though a customer may terminate the contract at any time, there are other risks such as incomplete software development, the lack of documentation, preventative maintenance manuals and source codes and whether someone else may be able to complete the task should the original consultant fail to do so.

Where the developer has assigned the copyright to the customer in writing, the latter should require the delivery of the source code. If no assignment is made,
a comprehensive express licence should be mandatory and desirable with the source
code put in escrow.14

From the customer’s perspective, the only way the customer can legally re-
quire the escrow agent to release the material is to sign a contract with the escrow
agent. This can be either a two-party contract as between the customer and the
escrow agent, or a tripartite contract as between the program developer, the cus-
tomer and escrow agent. If the only contract that exists is between the program
developer and the escrow agent, then the customer is unlikely to be able to enforce
disclosure.

It may also be prudent to tie payments with consultants to milestones of sig-
nificant events in program development where this is feasible. When this staged
payment plan is agreed to there will be incentives for the consultant to complete
tasks on time and the customer has the advantage of ensuring that program devel-
opment is on time and on budget.

Software development contracts do not assign copyright nor are source codes
given to the person requesting the software. On a literal interpretation of the con-
tract the person paying for the software development has neither copyright nor
general usage rights to the program, other than as a licensee. However, there is
always an implied term that the user may have a right to the program but this right
is accompanied by a duty to keep the source code confidential. Furthermore, an-
other implied term may be that the user will not be permitted to sub-licence that
right to other parties to use the program.

In regard to “bespoke” or customised software written to the requirements of
a client the situation may be entirely different from that described in the previous
paragraph. By definition bespoke software is written pursuant to a direct contract
between a programmer and the client.15 The software may not exist at the time of
the contract. Hence, two legal implications may be read here. First, a bespoke con-
tract may vest IPR of the software to the person requesting the software including
copyright and confidentiality, along with patent rights. This is contrary to the law
which vests copyright on an author automatically even though commissioned by
another.

In England, it has been held that if there were no express provision as to
ownership, it would be open to a court to imply that notwithstanding the general

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14 Escrow is an ancient legal term relating to deeds. A deed is binding upon delivery; so
an escrow agent is an independent third party who holds a sealed deed and guarantees its deli-
very to the intended party under certain conditions. This is a useful device in the case where if
a software developer went out of business and the customer needed access to the source code in
order to either modify certain steps or to update the software itself.

15 I. Smith, Chapter 1: Software Contracts [in:] C. Reed & J. Angel (eds.), Computer Law
rule, in equity the copyright belongs to the user. However, in order to reach such a conclusion, there would have to be some evidence that this was the intention of the parties. In *Saphena Computing Ltd. v Allied Collection Agencies Ltd.*\(^{16}\) a company that commissioned software to be written claimed that it owned the software by reason merely of the fact that it commissioned it. The claim was denied by the Learned Recorder who stated that “the commissioning of a computer program by a person is not of itself sufficient to vest copyright in that program in that person”. However, in *John Richardson Computers Ltd. v Flanders*\(^{17}\) an English court held that the computer program written by independent contractors belonged in equity to the company that commissioned it. This holding has since been reviewed in *Cyprotex Discovery Ltd. v The University of Sheffield*\(^{18}\) where an English Court of Appeal has upheld the finding at first instance that the claim of copyright by a university had merit even though the researcher in question was employed by an external company.

A second legal issue arising from bespoke software is the nature of the contract itself. Sometimes the agreement could either be a sale or a hiring of the software. A bespoke software contract could also be one either for services alone if no materials are transferred or for work and materials, the major component of which the provision of services forms a large part of the entire contract. The terms to be implied from either of these will depend on the circumstances of each case. The provision of services implies that it will comply with the particular requirements or achieve a given result. The provision of materials in the form of software and documentation implies that the software will be reasonably fit for its purpose. In most cases, however, the user may seek to impose express warranties in order to ensure the desired outcomes are achieved.

The issue of ownership therefore is not equivocal for it depends very much on what was agreed to and how the software developed as a result of the contract is both to be used and owned.

There are other features of personnel contracts that should also be considered. For example, in the US, such features as place of work, number and quality of personnel involved, rates of remuneration, overhead costs and formula for charging and insurance and liability issues should feature prominently in most personnel contracts. Also it should be made absolutely clear the extent to which a customer may be liable for the service provider’s employees should a contract be terminated prematurely.\(^{19}\)

\(^{16}\) [1995] FSR 616.
\(^{17}\) [1993] FSR 497 at 516-519.
\(^{19}\) See *Telecomputing Services Inc.* 1 CLSR 953 (1968).
The appraisal by consultants of the GIS needs of an organisation, for example, is another form of a personnel contract. The problem here might be how to access the competence of a consultant and how to avoid situations where the consultant may only be interested in “pushing” a particular product or software system. As the information industry has grown so rapidly there has been no measure of competence and skill except in the benefits of experience. It is likely that the GIS Certification Institute (GISCI) in the US and the Spatial Science Institute (SSI) in Australia may provide such evaluations on competency and skills for GIS practitioners.20

The issue of “poaching” and the raiding of employees by aggressive firms from their competitors are a further information industry issue. If the “raider” can show that it is only interested in an employee and not the training, experience or the contacts that that employee can bring, then there can be little or no difficulty. However, such is rarely the case. The former employer may have two possible avenues of relief. First, in contract a former employer may claim a breach by the employee of the terms that governed employment in a similar industry after termination of employment. Such a restriction may be possible in “closed” industries where there may be trade secrets involved, but such restraints must be reasonable in all circumstances, otherwise a court may not uphold such a restriction. Second, an employer may also rely in particular circumstances on torts such as conspiracy, inducement for breach of contract, interference with contract and the tort of “passing off”.21

Also in the US, a remedy in tort may also be available if it can be shown that the employee has misappropriated trade secrets and confidential materials.22 However, where contracts of employment contain burdensome clauses, a court could strike these down as unreasonable restraint of trade.23 On the other hand, an agreement not to actively compete with the former employer should not be stricken down merely because there would be an overly burdensome effect on the employee.24

Under the English common law, any contract that restricts a person’s right to pursue a trade or occupation is against public policy. Preparing to leave an

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employer either to join a competitor or to set up in competition oneself does not constitute such a cause if there is no solicitation of the employee by the prospective employer or inducing existing customers to transfer their custom to the competitor.25

In some industries, for example, information technology, a common practice in employment contracts is to have a term that restraints an employee from exercising their profession in a certain area or for a designated period of time. However, given that such contracts impact upon a person’s livelihood, the courts have tended to interpret such clauses narrowly. Such clauses are in addition to breach of confidence provisions that prevent an employee from disclosing a secret process or using a client list or other confidential information once they have terminated their employment with that particular employer. It is unfortunate that many contracts put together confidentiality provisions with restraint of trade provisions thus inviting confusion and increasing the likelihood that such provisions may be struck down by the courts.

Another scenario is a restraint against a current employee to stop them from competing against their employer by doing work for a competitor on the weekend or evenings. A court is more likely to prohibit such activity, even if there is no restraint of trade clause, because an employment contract involves a duty to be faithful to one’s employer.

In Australia, the law against contracts that unreasonably restrain trade in a profession has been classically stated in *Esso Petroleum Co. Ltd. v Harpers Garage (Southport) Ltd.*26 A more recent celebrated case in the U.K. is *Panayiotiou v Sony Music Entertainment (UK) Ltd.*27 that involved a dispute between the singer, George Michael, and his record company. Under a restraint of trade doctrine, a court will refuse to enforce provisions in a contract that unreasonably prevents carrying on a trade. In general, a restraint of trade is where it affects a person’s future ability to carry on his or her trade, business or profession. Such restraints are against the public interest unless shown to be reasonable in the interests of both the parties and the public.

Contractual liability and the privity of contract define roles and responsibilities. The privity of contract is a necessary element of the law to sheet home liability, identify responsibilities and to make reparation for damage and loss suffered between those parties in a contractual relationship. The doctrine of privity of contract defines the connection or relationship that exists between two parties in

Chapter VI. Geospatial Information: Enduring Contractual Issues

a contract. Vendors who supply data that are known to be inaccurate, incomplete or misleading and which might negatively impact on persons or property could give rise to a contractual liability. Similarly users of geospatial data may become subject to legal obligations to the provider or vendor when they fail to comply with provisions of the contract or use the geospatial products beyond the intended uses outlined in the contract. Examples of usage beyond the contract include using data incorrectly, whether intentional or otherwise, however, may be exposed to tortious liability.

A contract for the provision of a geospatial service may often specify a quality standard, for example, the scale, resolution, or accuracy to some national or international benchmark. How the contract is fulfilled, such as the type and quality of the media on which the data, product or service is to be delivered or maintained, the time of delivery including the updating of the data, and the privity of the contract or the exclusivity of the data represent the terms of the contract. A vendor will have to fulfil these terms in order to avoid any liability. Failure to deliver any of these may put one in breach of the contract.

The discussions in the previous sections demonstrate the evolution of the science of geographic information by presenting two dichotomies, that of product and service and that of an employer-employee. Each of these pairs presented nuanced issues of law that have been addressed by drawing analogies with previous case law and legislative provisions in the respective fields of law. In this evolution, GI science has morphed to GI systems and into GI services. This change has been assisted in a large part by the maturing of the digital environment where the collection, dissemination and use of geospatial data and information has been facilitated by innovative technologies and volunteers. It is to this so-called Web 2.0 environment that we turn to next to observe the “disruption” that innovation brings to the table and how the law of contract will have to adapt to cater for the new challenges.

5. Emerging Contractual Issues in the Web 2.0 Environment

Geospatial information from the collection of spatial data, storage, analysis and its use in information systems has been transformed by “disruptive” technologies (“innovative”) that have dictated a new modus operandi. In the Web 2.0 environment the Internet is an integral part of the infrastructure. Static pages of web sites have been transformed by the dynamic addition of new information by users. Sites are used and updated by collaborative and cooperative means for dialogue, creation of content, and meeting online of a virtual community. The previous age of the floppy disk and compact disc to exchange data and information has given way to the USB Flash drives and then to cloud computing. The displacement of
CDs and DVDs as a storage media by cloud computing (CC) removes the need for local physical media to store digital data and application programs. More likely the emphasis is on “service provision” of geospatial information however delivered. Geospatial information science has developed techniques and methodologies that deliver geospatial information systems quite simply and effectively so that today the need is for more ubiquitous geospatial information services. Geospatial information services include spatial computing for site selection, asset tracking, facility management, navigation and logistics. Ecologists use global positioning systems (GPS) to track endangered species and better understand animal behaviour while farmers use GPS for precision farming to increase crop yields and reduce costs. Educationalists use the digital virtual globe such as Google Earth to teach children about their neighbourhood and the world in an enjoyable way.

The new digital environment has made nearly everyone with a mobile device a map maker and a digital recorder. Nearly every phenomenon is observable, may be captured and may be mapped. Using cell phones, GPS devices and putting information on the Internet through various social media outlets has made the spatial context all important. The new cartographer may be untrained in GIS technology but nevertheless can contribute to location-based services that everyone uses. The volunteers and hobbyists who contribute to “crowd-sourced” information – volunteered geographic information (VGI) -- mapped by Google Earth Maps and OpenStreetMapping has brought GIS to the masses. While expectations are rising so are the legal risks. The more obvious one being privacy concerns generated by the ubiquity of location-aware devices that automatically record personal movements, habits and other information linked to one’s location. No less important are those concerns relating to the contributors of geospatial information and the kinds of tacit agreements they may be entering into. An understanding of the contractual issues in using “clouds” and “crowd-sourced” information would help develop different ways of leveraging existing resources and to tailor it to the legal framework.

Cloud computing is “an ICT sourcing and delivery model for enabling convenient, on-demand network access to a shared pool of configurable computing resources (for example, networks, servers, storage, applications and services) that can be rapidly provisioned and released with minimal management effort or service provider interaction.”

Cloud computing services are usually grouped into the following categories.

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- Software as a service (SaaS) – the provision of software over a network rather than the software being loaded directly into a locally available computer. Salesforce.com and ESRI ArcGIS and the Cloud are implementation examples.
- Platform as a service (PaaS) – the provision of computing platforms that create the environment for other software to run (for example, operating systems) over a network rather than being loaded directly onto a locally available computer. Microsoft Azure Engine and Google App Engine are examples.
- Infrastructure as a service (IaaS) – the provision of access to computer infrastructure (for example, data storage or processing capability) over a network that is used to complement local platform resources. Amazon Elastic Compute Cloud (EC2) is a well-known example.
- Data as a service (DaaS) – the provisioning of datasets and databases for use over a network or on the cloud platform itself. An example is Pitney Bowes Data Insight’s Data Market.

Cloud computing is a significant shift from the way IT solutions have been implemented in the past but these present new challenges. Many of these may be overcome by using skilled personnel in contract negotiation and vendor management to contractually address the legal risks related to service levels, data processing and storage, infrastructure/security, and an institution’s relationship with the cloud computing service provider. In a parallel field Tappler (2010) has provided advice on reviewing contracts with cloud service providers in higher education.30 Among the key takeaway messages include assurance of the minimum levels of service provision as well as remedies for a failure to meet these requirements. The ownership of data stored on the service provider’s system and one’s rights to retrieve these on termination of the contract; details of system infrastructure and security standards to be maintained and the rights to audit their compliance; and the rights and cost to continue or terminate use of the service.

A survey of cloud service provider agreements has shown that the cloud market is still relatively immature and this is reflected in a review of service provider’s standard contract terms. A 2010 study of thirty standard terms of cloud providers demonstrated a bias in favour of the provider, and many were potentially non-compliant, invalid, or unenforceable in some countries.31

2014. Other categories services include Backend as a Service (BaaS) and Information Technology Management as a Service (ITMaaS).

A review by the Australian Government Information Management Office (AGIMO) (2013) has shown that some standard terms on which many cloud computing services are offered may not meet all the legal requirements of an Australian government agency. The Better Practice Guide suggests that the contractual positions with providers need to be set out early in any procurement process and to negotiate agreements that are acceptable to all parties. The key legal issues addressed include protection of information, liability, managing the performance, ending the arrangement, resolving disputes and miscellaneous other legal issues.

Table 1 below provides a checklist of key contractual terms that require attention when negotiating cloud computing services with a provider. Some of the items on the checklist are discussed briefly below especially where there might be implications with the use of geospatial information.

The protection of the information includes those that impinge on privacy, security and confidentiality. For these the manner by which the records are kept and a right to audit such protection measures should be written into the contract. Compensation for data loss and the use of subcontractors are also to be monitored. Privacy obligations are paramount when moving data to the cloud. This might mean a loss of direct control over the information and in cases where the data are stored and processed outside the jurisdiction. Different means of indirect control might be available. However, it is important to ensure that the contract terms prohibit the service provider from using the data for its own purposes and that security measures are in place to protect sensitive data such as personal information. In regard to security measures contractual measures may include the location where the service is provided from, the level of encryption to be applied, security access protocols implemented and the physical media to store the data.

Liability issues relate to its limitations and indemnity clauses. Performance management cover service level agreements, response times, flexibility of service and business continuity where there are interruptions to the service and for disaster recovery. On termination of the arrangement there should be an agreement as to the circumstances when there is an end to the contract by mutual agreement, by default and rights to terminate. Where disputes surface choice of law and jurisdiction should be set out. There are miscellaneous other legal issues such as how to prevent and deal with harmful code, application of foreign laws, trans-border data transfers and export control and IPR ownership.

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33 Ibid.
34 For detailed legal and technical discussions of cloud computing issues see L.R. Lifshitz, Understanding Cloud Computing: Legal Issues and Best Practice, Cloud Computing Law, To-
Table 1.
Legal Checklist: Cloud Computing Contracts

**Protection of information**
- Privacy
  - Future Privacy Compliance
- Security
- Confidentiality
- Records management requirements
- Audits
- Compensation for data loss/revenue
- Subcontractors

**Liability**
- Limitations on liability
- Indemnity

**Performance management**
- Service levels
- Response times
- Flexibility of service
- Business continuity and disaster recovery

**Ending the arrangement**
- Termination for convenience and early termination fees
- Termination for default
- Provider’s right to terminate
- Legal advice on termination
- Disengagement / transition of services

**Dispute resolution**
- Choice of law

**Other legal issues**
- Introduction of harmful code
- Change of control and assignment / novation
- Change of terms at discretion of the provider


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- Application of foreign laws and trans-border data transfer
- Further issues
  - Freedom of Information Act obligations
  - Intellectual property ownership
  - Publicity by the provider in respect of agreement
  - Use of Commonwealth branding and logos by the provider
  - Responsibility for end-users
  - Export controls
  - Requirement to take updates

Managing the agreement
- Ensure that the agreement terms are appropriate and reasonable
- Understand the terms of the agreement and keep a copy handy
- Enforce the service level arrangements
- Be prepared to audit the provider
- Within reasonable limits, maintain a good relationship with the provider
- If things go wrong, be aware of contractual rights and obligations
- Seek legal advice if difficult issues arise


Cloud computing contracts have come to the attention of the EU European Commission because of concerns with its use and other legal obligations.35 One of the four key goals of the Commission’s cloud computing strategy is to create model contract terms. The other objectives include defining technical standards, a certification plan for service providers and increasing cloud adoption in the public sector. Model contract terms could include terms that are “safe and fair”, have agreed service level clauses, and personal data protection aspects relevant to cloud computing contracts. According to Justice Commissioner Viviane Reding “Contract law is an important part of our cloud computing strategy […] Making full use of the cloud could deliver 2.5 million extra jobs in Europe, and add around 1 percent a year to EU GDP by 2020. Uncertainty around cloud computing contracts may hinder cross-border trade.”36

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After cloud computing volunteered geographic information (VGI) has taken centre stage in that this new innovation has demonstrated the power and force of “crowd-sourced” information. VGI has addressed mapping needs in crisis situations and no more better illustrated than during the Haitian earthquakes of 2010. Volunteer mapping efforts that assist in relief efforts have since been used in the context of forest fires, floods, hurricanes and other disasters. VGI maps are created through the efforts of volunteers who capture and record information using mobile devices and submit these to a website or central agency that analyses, reviews and then publishes the data on base maps provided by OpenStreetMap or GoogleMaps. These contributors are novices and not professional map creators. While reliability and accuracy of VGI might be questioned the timely production of near-instantaneous maps during times of crisis has proven invaluable. Nevertheless liability issues have become apparent especially where there is an endangerment of life. VGI service providers hence ensure that they do not engage in “negligent” conduct and vet volunteer contributions.

It may be difficult to determine whether a VGI website is a product, service or mere information. Hence liability may attach in regard to negligent behaviour where a duty of care was owed and was breached and that there was a causal link between the negligent act and the loss suffered. However, as the contributors may not have any specialised training or expertise in mapping or geography, mistakes and errors may creep in. Exercise of due diligence of a reasonable person is the threshold test for any liability. But, liability may be unlikely for an innocent mistake.

The contractual relationship between the VGI website and users are through the “Terms of Use” posted on the web page. For contributors, particular care must be exercised by not giving or promising any type of warranty or guarantee for the data submitted. To do so might expose and heighten the risk of legal responsibility for any errors. Also contributors should not provide any indemnification for the data and information submitted. This will avoid having to defend indemnity in the courts on behalf of the VGI website.

6. Future Legal and Policy Frameworks

Fundamental to this chapter is the analysis of the contractual setting within which geospatial information products and services are established as well as the new legal issues being raised by activities in cyberspace. Just as the world has lawless places, in cyberspace there may be areas where there are as yet no laws. The law may in this way influence developments in geospatial information as much as it develops the legal environment.

This chapter has highlighted the multifaceted and prismatic nature of the law of contract as it relates to geospatial information products and services. The law of contract is an artefact of the common law built on precedent and so it is when applied to activities related to GIS. A deeper analysis of the product-service distinction followed by a discussion of different types of contracts for and of services has led to a greater understanding of the nuances involved and signposts for the unwary. The review of the law also addressed emerging contractual issues resulting from extensions of new methods of doing things, especially those that are based on the Internet.

This review of the legal and policy framework relating to contractual issues for geospatial information has tossed up a couple of enduring dilemmas that would require resolution soon. The first is that there is a lack of a multi-national legal or policy framework in place to deal with the legal issues discussed here. Whilst supra-national governance might be provided by the EU, for instance, there may be no international enforcement apart from jurisdictions within the EU. Perhaps attaching contractual clauses dealing with cloud computing and VGI under the various international UN-sponsored contract and sales of goods treaties might be one solution. Endorsing these under the various bi-lateral free trade agreements may also be feasible. The future in geospatial information contracting will be witness to the situation where data may be acquired in one or more countries, processed in a second country with the corporate entity and service provider domiciled in a third. The data itself might be stored, archived and curated “in the cloud”. Contractual and liability concerns remain unclear under such a scenario.

A second conclusion is that there still remains a disparity between the legal and the policy framework in any jurisdiction. Cloud computing demonstrated that it exists “without boundaries” because it may be accessed from anywhere and at any time and with any device. While technological developments are proceeding at great speed to the point of being “disruptive”, there is a lag in the legal infrastructure. This lag may also be responsible for the fragmented and uneven treatment of legal responses.

Contractual issues do not take place in a vacuum. There are inevitably interactions between the various theories of law including tort liability, intellectual
property and legislative provisions. In many jurisdictions contract law has been
codified, even the common law; and this is in response to the rise of consumer pro-
tection concerns. This may be because the parties are literally at arm’s length when
agreements are formed or that there might be in an unequal bargaining position.
The Web 2.0 environment has now forced a re-think of contractual obligations
and shifted the paradigm from the desktop to the hand-held device to the cloud.
What the resulting landscape might look like in the future will largely depend on
whether the law has developed to lead innovation or whether there will be a lag
with the law attempting to catch up with technology. Discourse in these matters
may only assist in promoting better practices and behaviours for the benefit of all.
Chapter VII. Geoinformation and the re-use of spatial data

U.i.i.p. is a legal act which directly concerns the re-use of spatial data. This issue is regulated by Art. 12 and Art. 13 of this law. In this context, the regulations use the term spatial data services. This term is defined in Art. 3 item 10 u.i.i.p., according to which these are „the operations which may be performed, by invoking a computer application, on the spatial data contained in spatial data sets or on the related metadata”. Compliant to Art. 9 sec. 1 item 1-4 u.i.i.p., these services depend on discovering, viewing, downloading, and transforming spatial data sets. (Art. 9 sec. 1 item 5 u.i.i.p. additionally mentions the services allowing spatial data services to be invoked). A spatial data set is, pursuant to Art. 3 item 11 u.i.i.p., „an identifiable collection of spatial data”. Finally, according to Art. 3 item 1 u.i.i.p., spatial data are „any data with a direct or indirect reference to a specific location or geographical area”. Art. 12 sec. 2 u.i.i.p. states that data available through discovery services „may be in a form preventing their re-use for commercial purposes”. The notion of re-use shall be equated to the notion of re-using in u.d.i.p. regulations however, it should be noted that in the light of Art. 23a sec. 1 u.d.i.p., the notion of re-use comprises both, commercial and non-commercial use. The same notion is used also in u.o.b.d. Since the re-use of spatial data may be excluded only in the case of viewing services (inherently discovery services do not provide the access to the content of datasets), it has to be assumed that the services which allow re-use of the data are the download and transformation services. In this regard, one should point out Art. 12 sec. 3 u.i.i.p. which states that downloading and transforming spatial data sets „is to be performed with the respect of regulations concerning public registers which contain these data sets”. In the case of spatial data sets, such regulations are especially these of u.p.g.k. Compliant to Art. 40 sec. 3c u.p.g.k., “Making available data and information collected in the data bases mentioned in Art. 4 sec. 1a and 1b, standardized cartographic documents mentioned in Art. 4 sec. 1e, and other materials of the national geodetic and cartographic resource (...) is chargeable subject to

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1 In this paper, the author uses fragments of his other work i.e. K. Felchner, Jak poruszać się po mapach przepisów dotyczących map (prawo autorskie, o dostępie do informacji publicznej, o infrastrukturze informacji przestrzennej, o geodezyjne i kartograficzne) [in:] P. Cybula (ed.) Prawne aspekty bezpieczeństwa w górach – turystyka, rekreacja, sport, Kraków 2013, p. 55-70.
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sec. 3d and Art. 12 sec. 1 and 2, Art. 14 sec. 1, Art. 15 sec. 2 and 3 u.i.i.p. (…)

Art. 12 sec. 4 u.i.i.p. states that the administrative organs may in such cases collect a fee, if it is in accordance with separate regulations (which again refers to mentioned u.p.g.k. regulation), and these services are provided „with respect of the regulations regarding e-commerce”. The Directive 2007/2, which is implemented by u.i.i.p., somewhat adds in Art. 14 sec. 4 that the services may be „covered by disclaimers, click-licences or, where necessary, licences”.

Apart from u.i.i.p., the legal basis for the re-use of spatial data is also provided by u.d.i.p. As it has already been pointed out, according to Art. 3 item 1 u.i.i.p., spatial data are „any data with a direct or indirect reference to a specific location or geographical area”. Whereas compliant to Art. 1 sec. 1 u.d.i.p., public information is „every information concerning public matters”. Such definition is very laconic, and despite being expanded in Art. 6 u.d.i.p., the included catalogue is only of a demonstrative character. Not until the review of the jurisdiction do we work out what in practice is considered to be public information. In the scope of this text, one may consult the WSA in Warsaw ruling regarding the Computerized Map of Hydrographic Division of Poland, and the series of NSA rulings concerning the provision of maps which were an element of the study about the conditions and directions of spatial development in Rabka Zdrój. These rulings concern only the access to public information, but the court’s arguments that a map is classified as public information, mutatis mutandis, can be used in the trials about the re-use of public information. Also the verdicts of the administrative courts which concerned the maps included in the national geodetic and cartographic resource should be listed. These judgements state that also such maps are public information, the rules for their sharing are set by u.p.g.k., and not by u.d.i.p. The grounds for such reasoning is the wording of the Art. 1 sec. 2 u.d.i.p. The practical significance of this interpretation consist of that, u.d.i.p. principally allows free access, u.p.g.k. provides for the obligatory access fee.

The analysis above results in the conclusion that the semantic scopes of the terms „spatial data” and „public information” partially overlap each other. A similar claim is to be found in the literature. This conclusion is reached on


the basis of the analysis of the judgements concerning the access to public information itself, and not on the grounds of the regulations concerning the re-use of public information. Chapter 2a u.d.i.p. regarding this issue does not contain a separate definition of public information, thus the definition established earlier is applicable. The Directive 2003/98 which is implemented by the regulation in the u.d.i.p. uses the notion of a public document, and not a public information. However, the definition of the document in Art. 2 item 3 of this directive (including also recital 11 of the preamble), seems to be even broader than the definition of public information. The Guidelines seem to propose that Art. 23a sec. 1 implements the notion of a document. Art. 23a sec. 2 item 2 u.d.i.p. which includes public finance units to the subjects obliged to provide public information for its re-use, it allows us to assume that this obligation rests on the local self-government bodies, and the Chief Surveyor of Poland. Also, we have to mention the collision norm of sec. 5 of the mentioned Art. 23a u.d.i.p. which states that “The regulations of this chapter do not violate the regulations of other acts defining other rules of using public information, under a condition that they guarantee to abide to the rules of this act.” This regulation seems to attribute supremacy to the regulations of chapter 2a in the situation of collision with other regulations which set the rules of using public information in a less favourable way. It has to be stressed out that according to Art. 23b sec. 1 u.d.i.p., it is a principle that making public information available for re-use is free of charge. It is a different solution that the abovementioned u.i.i.p.’s, as indicated above. So, the problem is a practical one, boiling down to the question whether making data available for re-use is chargeable. The Guidelines propose the collision norm to be included in u.i.i.p., due to which the regulations concerning the re-use of data will not violate u.i.i.p. principles. Ultimately, however, the act lacks such an article. A presence of such article would settle the relationship between u.d.i.p. and u.i.i.p., but it would also indirectly influence the relationship between u.d.i.p. and u.p.g.k. (regarding the data included in the national geodetic and cartographic resource which are made available in the view of u.i.i.p.), while Art. 40 sec. 3c. u.p.g.k. directs to relevant regulations of u.i.i.p.

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5 The Guidelines to the act draft on the amendment to the access to public information act and some other acts, version of 5 May 2011, http://www.bip.msw.gov.pl/portal/bip/218/18369/Projekt_Zalozen_do_projektu_ustawy_o_ponownym_wykorzystaniu_informacji_publicznej.html (these guidelines have several versions, the author uses the one from the date indicated above), henceforth Guidelines, p. 14, 65.

6 The Guidelines, p. 23.
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The issue of relation between u.d.i.p. and u.p.g.k. has been noticed in the literature. Recently, especially regarding the interpretation of the mentioned collision norm act Art. 23a sec. 5 u.d.i.p., it has gained the attention of the jurisprudence as well. Commenting on the verdict will allow us to make an in-depth analysis of the issue of the re-use of geoinformation.

The factual findings are as follows. There was a request for a topographic database (topographic map of Warsaw) in order to re-use it, made to Head Office of Land Surveying and Cartography (GUGIK). GUGIK refused free access, pointing out that, inter alia, the base is a part of the national geodetic and cartographic resource, which with compliance to Art. 40 sec. 3c u.p.g.k., allows to charge the applicant an appropriate fee. WSA in Warsaw, in the verdict of 2012, stated that the application of Art. 23a sec. 5 u.d.i.p. leads to the conclusion that the organ is obliged to provide the requested database free of charge, because u.p.g.k. provides for such rules for using public information which do not guarantee maintaining the concord with the rules of u.d.i.p. For the rule is, according to Art. 23b sec. 1 u.d.i.p., the lack of fee. The court cited the lex posterior derogat legi priori rule, pointing out that the regulations of u.p.g.k. were rescinded by the new regulations of u.d.i.p. concerning the re-use of public information.

In the verdict of 2013, as a result of the GiGiK cassation appeal, NSA argued that „The exclusion of u.d.i.p. on the basis of Art. 1 sec. 2 concerns the whole act, and not just its chapters: 1 and 2, the collision norm in the Art. 1 sec. 2 u.d.i.p. is of a general nature. While the collision norm in the Art. 23a sec. 5 u.d.i.p. is a specific one because it concerns the re-use of public information”. It can be added that the subject of the court’s deliberation was also the interpretation of Art. 6 sec. 1 item 3 letter f u.d.i.p., according to which public information should be construed as data about the registers, and not the data gathered in the registers, however, this issue is out of this paper’s scope as a less significant one.

In order to make a comment on this verdict, there is a need, according to the author, to employ multidimensional reasoning. A reference has to be made to the regulations of the directives which are implemented by the regulations of u.d.i.p. and u.i.i.p. Also, there is a need to analyse more precisely the regulations of u.d.i.p. itself paying attention to the content of the guidelines and the statement of reasons of the draft which introduces to u.d.i.p. the regulations concerning the re-use of public information. There is also a requirement for the reference to the regulations of u.p.g.k.

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7 S. Szczepaniak, Ponowne wykorzystanie danych przestrzennych, Wspólnota No. 21-22/2012, p. 32.
8 WSA in Warsaw, verdict of 24 October 2012, II SAB/Wa 245/12, available at CBOSA.
9 NSA verdict of 5 April 2013, I OSK 175/13, available at CBOSA.

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With regard to the directive 2003/98, it has to be indicated that, in the light of the recital 9 of the preamble „This directive does not contain an obligation of allow to re-use documents. The decision whether or not authorise re-use will remain by the Member States or the public sector body concerned, while in concord with the Art. 3 of the directive “Member States shall ensure that, where the re-use of documents held by public sector bodies is allowed, these documents shall be re-usable for commercial or non-commercial purposes in accordance with the conditions set out in Chapters III and IV”.

It has to be stated that the Polish legislator introducing to Art. 23a sec. 2 u.d.i.p. the obligation to providing public information for their re-use, transgressed the minimum imposed by the directive. Next, the recital 14 of the preamble and its Art. 6 allow to charge for the re-use of the documents. The directive also includes the regulation concerning the relations of the institutions of the access to documents and their re-use, a topic which is discussed later in this paper. The Directive 2007/2 allows in Art. 14 sec. 1 and 2 (a contrario) the possibility of charging for the download of spatial data sets, while in Art. 14 sec. 3 stipulates that data available through discovery services may be in a form preventing their re-use for commercial purposes. The directive also states in recital 8 of the preamble and Art. 2 sec. 1 that “this Directive should be without prejudice to directive (…) 2003/98 EC”. Therefore, in the plane of the relations of the regulations of the directives, in principle, there is no conflict. The Directive 2007/2 allows to limit the right to re-use spatial information, and it also allows collecting fees for it – which is, however, within the regulatory boundaries of the re-use of spatial information emerging from the directive 2003/98. The literature also claims that an interested person may apply for a paid access to spatial data on the grounds of the access to public information act or download data for a fee from the geoportal basing on the regulations of the infrastructures for spatial information.\textsuperscript{10} It has to be noted, however, that Art. 14 sec. 3 of the directive results in a claim that data available through view services cannot have a form which makes a non-commercial re-use impossible. The collision on the regulation plane between u.d.i.p. – u.i.i.p. (and thus u.p.g.k.) is the result of the way of the implementation of the directive to the national legal order. Especially, the issue is that u.d.i.p. stipulates, according to Art. 23a sec. 2 and 23b sec. 1, as the matter of principle, an obligatory and free-of-charge provision of information for its re-use by the obliged subjects.

When regarding the regulations of u.d.i.p. itself, in this scope, we should concentrate on the relation between the right to the access to public information and the right to the re-use of public information. The comparison of Art. 2 and

Art. 2a of u.d.i.p. may lead to a conclusion, that these two constitute separate institutions. The relations between them are described in Art. 2a sec. 2 u.d.i.p., according to which „The rules for the re-use of public information do not violate the right to the access to public information nor the freedom of communicating it”. According to the Guidelines11 „The regulations concerning the re-use do not set their own rules concerning the access to information. In other words: firstly, they are established the rules for the access to information, later they are set the rules for the re-use of existing information. In order to eradicate any doubt in this matter, they will introduce to the act a rule inspired by Art. 1 sec. 3 of the abovementioned directive, confirming that the re-use does not infringe on the right to information described in the access to public information act”. The referred to regulation of the directive states that „The following directive is based on and is without prejudice to the existing access regimes in the Member States”. Therefore, a re-use concerns only such types of information which may be made available in compliance with appropriate regulations. U.d.i.p. regulations are of course such regulations, but not only them. According to Art. 1 sec. 2 u.d.i.p. „The provisions of this act do not infringe on the provisions of other acts which define different rules and mode of the access to public information”. This provision gives primacy to the regulations of specific acts. This way, the collision norm from Art. 2a sec. 2 u.d.i.p. refers to other collision norm from the Art. 1 sec. 2 u.d.i.p. A question arises, however, how to understand the third collision norm expressed in Art. 23a sec. 5 u.d.i.p. This regulation states that „The regulations of this chapter do not violate the regulations of other acts defining other rules of using public information, under a condition that they guarantee to abide to the rules of this act”. This regulation seems, unlike the previous one, give primacy to the regulations of u.d.i.p. It has to be noted that the regulation uses the expression „rules of using public information” and not „rules of making public information available for re-use”, as indicated above regulation of Art. 1 sec. 2 u.d.i.p. which uses the expression „mode of access”. Thus, it can be claimed that this regulation does not concern the rules of making information available, but only the rules of using information, and in this scope it gives primacy to the specific acts. This interpretation is based on an assumption that the re-use of information is not a separate mode of access to public information, but it is somewhat an extension of the mode of access regulated in u.d.i.p. or in the specific acts. The literature (before the referred NSA verdict) expressed a different view on this issue.12 It has to be also acclaimed that the chapter 2a u.d.i.p. does not correlate

12 K. Siewicz, Prawne aspekty korzystania z rejestru cen i wartości nieruchomości, vol. 10, issue 3 (53), 2012, p. 133.
with this assumption. The expression „making available for the re-use” which appears to suggest that this is a separate mode of access to public information. Moreover, in the statement of reason to the u.d.i.p. draft\textsuperscript{13} it is pointed out that „The basic aim of the drafted amendments is the introduction to the national legal order a new (fifth) mode of access to public information”. The literature criticizes this understanding of re-use.\textsuperscript{14} The literature indicates (although in a somewhat different context) that the issue of the relation between the access to documents and their re-use is a problematic one, solved differently in individual legislations.\textsuperscript{15} When assuming the abovementioned premise, it leads to the conclusion that it is possible to individually regulate the rules of access to public information (including prospective fees) in the specific acts, which then have priority over u.d.i.p.; and separately, regulate the rules of re-use of public information (including prospective fees), which are then inferior to the regulations of u.d.i.p. It seems that this stance has appeared in the literature.\textsuperscript{16} One needs to be aware, however, that such assumption may lead to somewhat absurd and impractical results. First of all, when a regulation predicts a fee for making data available for re-use (in the present legislation nomenclature), it is hard to state whether this fee is for access to them, or it is a fee for re-use (or what part of the fee is for access to them and what part of it is for the re-use). Such situation raises doubt whether interpret it in the light of the collision norm of Art. 1 sec. 2 u.d.i.p. or Art. 23a sec. 5 u.d.i.p., and these two norms contradict each other. A given act may also regulate the issue of the access to information itself (including prospective fees), not mentioning the possibility of its re-use. In this case, one should assume that the re-use of such information is permitted, formally free-of-charge (additionally assuming that the given information is not a copyrighted or the \textit{sui generis} right to the data base item), however, such an assumption is not a certain one as well – to be discussed below. However, on this occasion, the access fee becomes \textit{de facto} a re-use fee. In a sense, such mechanism was employed in the discussed matter. Art. 40 sec. 3c u.p.g.k. does not directly refer to the re-use of data, it only deals with making them available. It is only for the included reference to Art. 12 sec. 1 and 2 u.i.i.p. that one can indirectly infer that it is permissible to

\textsuperscript{13} Draft bill stipulating the amendment to the access to public information act and some other acts, Sejm printed matter No. 4434 of 13 July 2011, p. 2.

\textsuperscript{14} M. Bernaczyk, Ponowne wykorzystywanie informacji publicznej. Zarys instytucji, Wrocławskie Studia Sądowe, No. 4/2012, p. 10.

\textsuperscript{15} K. Jansen, op. cit., p. 341-344.

charge for a download service which may in practice be used for obtaining data for their subsequent re-use. Making data available on the premises of u.i.i.p. takes place only via a geoportal, but it can be assumed that it is, according to Art. 23g sec. 1 item 2 u.d.i.p., a form of making public information accessible in a different way that via Public Information Bulletin. In this context, the literature considers classifying the geoportal as a data base protected by *sui generis* right.\footnote{M. Jankowska, M. Paweleczyk, *Korzystanie z zasobów witryny internetowej Geoportalu a dozwolony użytek prywatny w prawie autorskim*, PUG 2/2012, p. 9.} It is worth adding that pursuant to Art. 23b sec. 3 u.d.i.p., data bases are also subject to the re-use regime. Also Art. 19 u.p.g.k. is worth our attention, according to which „*Dissemination, distribution, and reproduction for the dissemination and distribution of maps, photogrammetric and remote-sensing materials, constituting the national geodetic and cartographic resource, requires the permission of authorised organs*”. This provision is supplemented by the regulation\footnote{The Regulation of the Minister of Regional Development and Construction of 15 May 2001 concerning the determining the types of maps, photogrammetric and remote-sensing materials, constituting the national geodetic and cartographic resource, whose dissemination, distribution, and reproduction for their dissemination and distribution requires a permission, and the mode of giving this permission (Journal of Laws [Dz. U.] No. 56 Item 588).} which specifies the materials, moreover in § 3 it contains a base for the issuing organ to set the dissemination conditions and the amount due (fee) in the permission. This regulation concerns re-use in a class of its own, although the order itself has been in effect for over a decade, predating the directive 2003/98. The literature also considers whether this regulation is an expression of granting the State Treasury the *sui generis* exclusive right to the indicated materials.\footnote{K. Siewicz, *Kto …*, p. 414.} Regarding this position, it can be added that the constructional assumptions of a re-use institution, emerging from the directive 2003/98, incline to make a thesis about creating a *sui generis* law of the re-use of public information. In short, the European legislator allows imposing appropriate conditions of re-use of public information (often being unprotected official material or data base which cannot be protected by *sui generis*), charge for it, and in some cases even issue an exclusive license only for one user.\footnote{K. Felchner, *Re-use utworu (bazy danych)*, Zeszyty Naukowe Uniwersytetu Jagiellońskiego – Prace z prawa Własności Intelektualnej, No. 1 (119), 2013, p. 33.} Regulation of Art. 19 u.p.g.k. somewhat corresponds to such construction. Still, it is hard to determine the relation of this regulation to the regulations of u.d.i.p. concerning the re-use of public information. It is arguable, however, whether this regulation which was probably designed with the actions of traditional cartographic publishers in mind is applicable also to the dissemination over the Internet. It has to be noted that together with the amendment of the u.d.i.p. regulations by introducing an institution of re-use of public
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information, the legislator also amended the laws of several specific acts (vide Art. 2-8 of the amending act\textsuperscript{21}). In these amendments, the legislator made an attempt on introducing the difference between the access to public information and the re-use of public information, using for these acts explicite the latter term (an in-depth discussion on these regulation is omitted). The legislator did not introduce the notion of re-use directly to the regulations of u.p.g.k., but only made a reference from Art. 40 sec. 3c u.p.g.k. to Art. 12 sec. 2 u.i.i.p. Only \textit{a contrario} from Art. 12 sec. 2 u.i.i.p. can we infer (as indicated before) that the services other than discovery and view of data, that is download and transformation services, shall allow re-using data. From Art. 12 sec. 3 u.i.i.p., which refers to Art. 40 sec. 3c u.p.g.k., it is evident (as well as indicated before) that such services may be provided with a fee. The literature puts an emphasis on the fact that in the context of the implementation of the directive 2007/2, the amendment of u.p.g.k. is indispensable.\textsuperscript{22} It is surprising, therefore, that such a complicated method of regulating this matter by making references back and forth between u.p.g.k. and u.i.i.p. was accepted, for it is troublesome for the reader (not to mention the above discussed relation between three collision norms in u.d.i.p.).

With reference to the argument \textit{lex posterior derogat legi priori} which was used by WSA in Warsaw (NSA did not make a reference to this fragment of the legal argument of the first instance court), it can be expressed that despite the u.d.i.p. regulations concerning the re-use came later into force (29 December 2012) than u.i.i.p. (7 June 2010), it was rather caused by the delay of the Polish legislator when implementing the directive 2003/98 (according with Art. 12 of the directive, it would have been implemented until 1 July 2005, while the directive 2007/2, according to its Art. 24, until 15 May 2009, it may be mentioned that the deadline of implementing the first directive had expired two years before the latter one was passed). Moreover, \textit{lex posterior generali non derogat legi priori speciali}.

To sum up, in the view of the author, the interpretation of the u.d.i.p. regulations by NSA in the discussed verdict is not groundless. The discussed matter involves, however, so many interpretation issues stemming from the unclear formulation of the regulations of Polish law that it can be assumed that it will still raise doubts, and the discussion in this regard cannot be claimed to be over. There is a need to call for the amendment of the law in order to eradicate the uncertainties.

Some present circumstances may create a chance for such amendment, and these are produced at the end of this work.

\textsuperscript{21} Act of 16 September 2001 on amending the access to public information act and some other laws (Journal of Laws [Dz. U.] No. 204 Item 1195).

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So, in the recent verdict\textsuperscript{23} The Constitutional Tribunal, on a motion of the Ombudsman decided that Art. 40 sec. 5 item 1 letter b u.p.g.k. is unconstitutional. The verdict, however, does not concern the re-use of public information, so in a nutshell, we may mention that the Ombudsman pointed out, and the Constitutional Tribunal shared this position that such a fee may be treated as a kind of a public tribute, thus the act should specifically regulate its amount. The disputed u.p.g.k. regulation does not meet these requirements, allowing the freedom of establishing charges. This verdict can be of a practical importance in the issue in question. From the perspective of the persons who want to use the national geodetic and cartographic resource, it means further legal uncertainty because it is hard to predict the payment amount in the future. On the other hand, the necessity of amending u.p.g.k. in this regard may be a chance to also amend u.p.g.k. in the scope of the re-use of the materials from this resource.

Also, a draft guidelines on the bill for the open public resources has to be mentioned. These guidelines state that maps and plans are excluded from the scope of public information subject to access or re-use.\textsuperscript{24} In the light of the discussed regulations and judgements, this statement is mostly incorrect. The published guidelines, as a matter of fact a bit vague, has been criticized, and another version of it was announced. Because of this, it is hard to predict in what way the draft will influence the re-use of spatial data.

Finally, it has to be added that presently (June 2013), the amendment of the directive 2003/98 is being finalized. The aim of the amendment is to broaden the subjective scope, adding for example archives, and the introduction of the obligation, and not just the possibility of making the documents available for their re-use. New regulations may in some way influence providing maps and plans. The implementation of the mentioned amendment to the Polish legal order may be an opportunity to eradicate the interpretational doubts concerning the provision of spatial data.

\textsuperscript{23} Constitutional Tribunal, verdict of 25 June 2013, K30/2.
Chapter VIII. Legal aspects of using space-derived geospatial information for emergency response, with particular reference to the Charter on Space and Major Disasters

1. Introduction

Major disasters, man-made as much as natural, seem to be rapidly increasing in both size and frequency over the last years, though this impression may be due partly to the increasing media average of such events—the images from the tsunami that hit South and Southeast Asia, then the catastrophic earthquake in Pakistan, are still fresh on everyone’s mind. What is beyond doubt, is the increasing attention being paid to the potential offered by geospatial information, in particular if generated with the help of satellites in outer space, to contribute to mitigation measures in the various phases recognized, from preparedness and alert to long-time rehabilitation.

The most visible aspect thereof no doubt concerns the establishment of the Charter on Space and Major Disasters as of 2000. The Charter, essentially the first rudimentary “organization” of activities in the field, was established by a number of leading space agencies with operational remote sensing capabilities, initiated...
by ESA and the French space agency CNES in 1999 as a follow-up to the UNISPACE III Conference where the potential earth observation in the context of major disasters was prominently discussed. The Canadian Space Agency (CSA), the US National Oceanic and Atmospheric Administration (NOAA), the Indian Space Agency ISRO, the Argentine National Commission on Space Activities CONAE, the Japanese Aerospace Exploration Agency (JAXA), the United States Geological Survey (USGS), DMC International Imaging, the China National Space Administration (CNSA), the German Aerospace Center (DLR), the Korean Aerospace Research Institute (KARI), the Brazilian National Institute for Space Research (INPE), the European Organisation for the Exploitation of Meteorological Satellites (EUMETSAT) and the Russian Federal Space Agency (Roscosmos) all successively joined, so that the Charter currently counts fifteen full-fledged partners.4

In many respects, however, the establishment of the Charter merely represents the most institutionalized context for using geospatial information for disaster and emergency response purposes: most of the legal issues playing within the context of the Charter are of wider relevance for the field as a whole. Thus, the current contribution constitutes an effort to discuss some of those international legal issues considered of relevance from such a more general perspective. The main limitation here is that of focusing on satellite-derived geospatial information as opposed to \textit{in situ} or airborne methods of generating geospatial information.

This is, indeed, a substantial limitation: mainly because of the novelty of the issue, there is as of yet \textit{no} law or regulation dedicated to, and tailor-made for, the issue. While this does not result in a total legal vacuum, it does mean that recourse will generally be had to a few more general legal regimes, not at all developed with the prospect of deriving geospatial information from satellites in mind, yet turning out to have some bearing thereon as well. The novelty of the issue, moreover, will also mean there is as of yet insufficient practice to go into any details as to what precise impact those general regimes would have on space-derived geospatial information. Law, after all, only comes alive when persons or legal entities start using it for the purposes of defending their own self-perceived interests.

The current contribution will thus address the following four sets of legal international issues in somewhat greater detail:

1. The application of copyrights to geospatial information products relevant for emergency response as far as resulting from satellite activities.
2. The international regime applicable to access to data, which result from remote sensing, \textit{vis-à-vis} the application of copyrights.
3. Responsibilities and (in particular) liabilities which may result from satellite-based geospatial information operations and activities.

\footnote{Ibidem.}
4. Security and dual-use issues in the context of using geospatial information for emergency response, to the extent that existing international arrangements may have a bearing on the legal context within which certain emergency services or products might be provided.

This certainly does not pretend to offer an exhaustive list of relevant legal and/or organizational issues involved. However, such other legal issues as privacy (in view of the current state-of-the-art potential of some satellites to offer very detailed “pictures”) or telecom law (as relevant for various telecom-related aspects of remote sensing satellite operations) would be one step further removed from the core aspect of using satellite-generated data for emergency response. Hence, they will not be considered here.

2. The Application of Copyrights

2.1. Copyrights and satellite remote sensing

Copyrights is the most relevant version of intellectual property rights in the current context since it directly refers to the intellectual ownership over the data and information generated. In view of their importance in stimulating creative activities, the first legal regimes to provide for copyrights— and a certain balance between the creator’s interests of protection and the public interests of access— were developed already centuries ago. Obviously, this has been done without very much taking into account the possibility that space-based data and information could also be involved. Still, once satellites started to generate data, subject to more experience with space-derived geospatial information as well as more analysis, such regimes might explicitly or implicitly come to apply to such data as well.

The generation of geospatial information by means of satellite is but a version of satellite remote sensing: the core of the systems providing the data and information to be used for emergency purposes consists of remote sensing satellites. These satellites operate in outer space, which is an area not subject to any territorial sovereignty. As a consequence, freedom of activity is the point of departure and any limits to such freedom have to be derived from existing legal principles or from rules, obligations and rights of other states stemming from international

treaties, including the UN Charter, or international customary law. For private parties involved, moreover, national regimes may (further) limit the opportunities to make use of the freedom of exploration and use of outer space. This also includes copyrights, much as they did not take space-specific aspects into account. Still, except where specific aspects of satellite operations generating geospatial information would be explicitly or implicitly prohibited or conditioned, such operations are basically allowed.

Historically, copyright regimes have been developed first and foremost at the national level. In general, copyright protection may be obtained for an original work of authorship fixed in a tangible medium. Relatively early on the international ramifications of hugely diverging national copyright regimes having become clear, one of the oldest international treaties provides for a first effort to align those national regimes, which resulted in a measure of “mutual recognition”. This 1886 Berne Convention was followed by a number of other international treaties further harmonizing national regimes as to their international effects. However, in spite of these international efforts, such fundamental differences as between a “first-to-file” regime (to which all European countries adhere) and a “first-to-invent” regime (to which inter alia the United States adheres) continue to exist.

2.2. The European context

In the international arena, developments towards harmonization have thus far stalled essentially at the level of “mutual recognition,” leaving much to be desired especially in terms of substance. For that reason, further to the above it is instructive to take a look at how in Europe specifically the issue of applying copyrights protection to satellite remote sensing has been dealt with, in view of the fundamental involvement of two intergovernmental organizations in space activities: the European Union and the European Space Agency (ESA).

In the beginning, within Europe the topic of copyrights in the context of remote sensing was considered a matter for ESA because of its key role in European space activities, including remote sensing activities. Thus, “the Agency shall, with regard to the resulting inventions and technical data, secure such rights as may be appropriate for the protection of its interests, of those of the Member States participating in the relevant program, and of those of persons and bodies under

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their jurisdiction". However, it rapidly became clear that ESA's own competencies were too limited for establishment of a more comprehensive legal regime; it could only effectuate relevant protection through, and as far as could be provided by, individual contracts.

On the other hand, when potential applications within Europe became a distinct probability, the European Commission became interested in the issue, in view of the possibility to use intellectual property rights as anti-competitive tools. Individual companies could, for example, use copyrights to sell licenses for exclusive access or usage in specific national territories, thus artificially carving up the Internal Market into nationally separated markets in contravention of relevant EU principles. A study initiated by the Commission resulted in recommendations to make the then-draft Community Directive on the protection of databases applicable to remote sensing data. This concerned the so-called “Gaudrat study” of April 1993, which concluded that the best way to effectuate any protection of remote sensing data would be to bring them under the heading of databases, rather than for instance copyrights.

The problem of appropriate legal protection of the data resulting from remote sensing was a consequence of the way in which the concept of copyrights had been developed historically. One of the main problems with raw data is that it does not satisfy the originality criterion for protection by copyright: there usually is no creative human intervention involved in producing them—especially if they are generated automatically or in a pre-programmed fashion. Collections of raw, corrected or treated data also fail to satisfy the originality criterion if there is no creative human intervention involved in producing collections of such data, read databases. This, of course, equally applies to the specific area of satellite-derived geospatial information data.

Still, for want of better legal tools, most operators in Europe used copyright protection to protect their data resulting from activities in outer space. Of course, in the absence also of any specific Community legislation on the matter, risks abounded that protection could differ between European states due to varying national copyright laws and/or varying interpretations thereof.

In this regard, the resulting Community Directive 96/9 established a *sui generis* right of database protection. It obliges the member states to include

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databases, amongst them those containing remote sensing data, in their national
telectual property rights regimes, in conformity with the parameters further
provided by the Directive. It applies both to nationals (including companies) from
EU member states undertaking such activities, and to such activities if undertaken
from the territory of any of the EU member states.\textsuperscript{11}

In other words: any satellite activities generating geospatial information con-
ducted either by EU nationals or from the territory of an EU member state could
enjoy the protection of Directive 96/9 — for example to limit access to the relevant
data. Outside of these situations, that is if neither an EU national (whether person
or legal entity) is crucially involved in the generation of date, nor such genera-
tion is (at least for a major part) conducted and undertaken from an EU member
state, such protection exclusively depends upon the national regime of the state in
question, where applicable in conformity with international treaties to which such
a state is party.

In terms of substance, the Directive protects creative databases under copy-
right law and creates a unique protection—the \textit{sui generis} right—for those data-
bases which do not meet the requirement of originality, as long as they are indi-
vidually accessible and require a substantial investment to be generated. In other
words, the \textit{sui generis} right extends protection to databases containing material
not protected by copyright. As a result, data derived from activities in outer space
and assembled in an original database are protected within the territory of the EU
member states.

The protection offered by the Directive basically consists of two sets of rights,
defined in Article 7(2) as the “extraction right” and the “re-utilization right” re-
spectively, both principally resting with the creator/owner of the database and for
him or her to license others to use. The “extraction right” refers to the right to
permanently or temporarily transfer all, or a substantial part, of the contents of
a database to another medium by any means or in any form. Likewise, the “re-
utilization right” refers to the right to make available to the public all or a sub-
stantial part of the contents of a database by the distribution of copies, by renting,
by on-line transmission or any other form of transmission. The first sale of a copy
of a database within the European Union by the right holder, or with his consent,
exhausts the right to control resale of that copy within the Union. The Directive
by now has been transposed into national legislation by all EU member states, as
was (of course) required by its terms.

\textsuperscript{11} Directive 96/9/EC, 1996, Art. 11(1),(2).
2.3. Copyrights and remote sensing data for emergency response purposes

Let us go back to the issue of geospatial information data in support of emergency management. Not just within Europe, but everywhere copyrights will obviously constitute a major parameter determining the scope of usage of satellite geospatial information data being allowed or practically possible in the context of emergency response, since they give the owner of the data a very fundamental legal tool to control such data.

In many cases, the entities generating relevant data will be public in character and legal role, in a perhaps varied but generally large measure. Here the issue would sometimes be whether they can effectively own copyrights in the first place. At the same time, it may be pointed out that such a public entity will have considerably less interests in using copyrights as a tool to limit access to relevant data, certainly as long as not security-sensitive.\(^{12}\) One main idea behind such constructs as the Charter after all is to provide what may be called public goods and services paid for at least in major part by the tax payers, which should benefit as much of society as possible, copyrights being used as little as possible to obstruct such benefits from being realized.

On the other hand, public investments in space-derived geospatial information should not allow private companies to take a free ride for their own, private and usually commercial purposes, piggy-backing on overly liberal access policies. In such cases, copyright may indeed present a handy tool for allowing some control over the downstream use of any satellite-generated data, which requires not only independent ownership of copyrights, but also attendant copyright strategies and policies.

The practical effects of such control tools of course ultimately depend on the general effectiveness of law monitoring and enforcement. There is certainly no perfect defense possible against malicious intentions, since in principle every state, organization or relevant entity can request remote sensing data. However, firstly the organizational structure for data request and delivery acts as a filter in a number of cases.

Secondly, as a consequence of the existence of copyrights, at least legally speaking instruments would be available to (try and) ensure that usage is made of the data downstream exclusively for proper purposes. One could draft an (additional) international protocol requiring any requesting organization to formally declare usage to be only for specific, well-delineated purposes. More pragmati-
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cally, one could also include relevant clauses in copyright licenses which certain data owners might require from users before allowing them access.

As a matter of fact, the Charter already knows of such a process to protect data exchanged under its sway. Raw satellite data is only exchanged between the Charter partners and entities defined by the “Charter Manager,” whereas others, including affected states and aid organizations, will only receive derived geospatial information such as maps, tables and prints. This process, clarified in advance and known to every Charter participant, might have the obvious drawback of impeding the rapid and efficient usage of the Charter’s data in a given event, if for example the information-derivers are missing relevant information which the affected states or aid organizations, if they were to analyze the data, would not miss out on, but it prevents at least raw data from being used for unintended, possibly abusive purposes.

Whether such measures would be sufficient “in the real world” to ban malicious use to a satisfactory extent is of course another matter, but with licenses and relevant clauses on usage one at least would have the legal tools to fight such use and criminalize those who undertake it. That certainly does not apply to Charter-induced data generation only, but to any geospatial information data with any real, read in particular potential commercial, value.

Furthermore, in a number of cases relevant data might be generated by (completely or partially) privately-owned and-operated satellite systems, like the French SPOT image, the Canadian Radarsat or various private US Very High Resolution-data satellite systems. Such private operators in principle would use their copyrights to control access to the relevant data, read to make money by allowing such access in individual cases against fees. It is their principled entitlement to decide whether, for example for reasons of public relations and public image, data would be provided when requested for emergency purposes, subject to any further conditions such as referring to usage other than directly emergency-related.

3. Access to Remote Sensing Data

3.1. From copyrights to data access rights

The previous Section dealt with the issue of copyrights, which provides an ad hoc-tool to deal with access to certain data sets — by establishing a specific balance between the rights of the general public to have access to a certain set, and the rights of the copyright owner to limit such access, as subject to applicable legislation. Apart from this issue at the international level there are a few legal parameters relevant for satellite-derived data, approaching the issue as it were from
the other end: that of obligations to allow access to remote sensing data—which might, in principle, come into conflict with applicable rights of copyright owners to limit such access. If such data access rights are unequivocally established by comprehensive legal regulation, they would actually override any potential rights to limit access by copyright owners, but the situation is usually not so clear-cut. This makes it difficult at this point to provide more detailed guidance as to what happens in case of such a conflict.

The parameters currently calling for immediate attention would be found in three areas in particular: the international legal regime for access to remote sensing data in general, the specific development of the Charter on Space and Major Disasters referred to earlier and general humanitarian obligations.

3.2. The international regime for access to remote sensing data

As referred to before, one of the most fundamental rules of space law is the principle of freedom of space activities. Consequently, the point of departure under international space law is that the activity of using satellites for remote sensing purposes is allowed. The Outer Space Treaty itself only provides for a few principles to which any space activities should conform, such as international cooperation, mandatory supervision and authorization of private space activities (for which a state is held responsible without further qualification), and sincere efforts to minimize harmful effects of one’s space activities, for example as to the environment.

More in particular, states are also held liable for damage caused by space objects involved in any private activities as long as they would have been involved in the launching of the space object concerned in a sufficiently substantial manner (in addition of course to liability for damage caused by their own space objects). This regime was further elaborated by means of the Liability Convention of 1972 which formally qualifies such involvement as that of a “launching State”.

The issue of remote sensing specifically, as a sub-set of space activities, at the global level has only been dealt with in any detail by UN General Assembly Resolution 41/65, adopted by consensus on 3 December 1986. This adoption by

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14 Outer Space Treaty, 1967, Art III, VI, IX.
15 Outer Space Treaty, 1967, Art. VII.
consensus, as well as the general respect accorded to its contents, leads most ex-
erts to consider those contents as reflecting customary international law—as a UN
General Assembly Resolution per se is not binding. The Resolution acknowledges
the freedom of remote sensing activities, as one particular manifestation of the
freedom of space activities subject only to international law. Further to this, the
Resolution provides some important parameters for remote sensing activities, in-
cluding those that are geospatial-information related, as follows.

At the outset it should be noted that the Resolution applies to remote sensing
activities “for the purpose of improving natural resources management, land use
and the protection of the environment”. Since such usage arguably would not
require the quality of spatial resolution of better than in the range of 10 meters.
Very High Resolution (VHR) data issues might actually fall outside the scope of
the Resolution. They certainly were not taken into consideration—or even envis-
gaged—at the time the Resolution was drafted. In view of the fact that much geo-
spatial information data would likely fall within the range of VHR data, this may
present a rather important issue in regard of which to further elaborate the law, so
as to at least establish the desired clarity.

In other words: the Resolution does not clarify to what extent the individual
discretion of states, European Union and international remote sensing operators as
to how to deal for example with dissemination and usage issues regarding VHR data
would still be intact. Privacy aspects typical of VHR remote sensing data dissemi-
nation at the very least have not been considered. Another issue following from this,
somewhat narrow, definition of remote sensing for the purposes of the Resolution, is
that it might be taken to exclude from its scope any military activities.

Then, Principle II provides that “Remote sensing activities shall be carried
out for the benefit and in the interests of all countries, irrespective of their degree
of economic, social or scientific and technological development, and taking into
particular consideration the needs of the developing countries”. This Principle re-
flects the similarly-phrased Article I of the Outer Space Treaty. Obviously, it very
much supports the general use of data, and information derived from them, for
emergency response purposes, although it also raises some questions as to the
extent in which such benefits are to be shared in a mandatory fashion.

Here, the frequently-found and rather general reference to “the benefit and […]
interest of all countries” with special consideration for the developing countries
was developed further in 1996, by means of another UN Resolution. This Reso-

\[\text{Frans von der Dunk}\]
olution left complete freedom to states “to determine all aspects” of such cooperation, and furthermore repeatedly referred to the requirement of “an equitable and mutually acceptable basis” for any activities undertaken in its implementation.\(^{21}\)

Principle IV of Resolution 41/65 then deals with the core issue of satellite remote sensing: the dilemma between the freedom of use of outer space, in its particular manifestation of freedom of information-garnering making use of satellites, and the principle of sovereignty of states over their own territory, more in particular over their own wealth and natural resources. These two concepts at the time of drafting the Resolution were considered to collide in particular where the “sensed state” finds itself in a situation that a “sensing state” might obtain valuable information, especially in economic terms, with regard to the territory of the “sensed state” which that state itself does not possess.

A balance of sorts has been established by Resolution 41/65, which in the final analysis tilts towards the freedom of space activities. The principle of full and permanent sovereignty, it is true, is to be respected, consequently legitimate rights and interests of the “sensed state” shall not be harmed, and also the benefit and interest of all countries shall be taken into account (that is, including those of the “sensed state”).\(^{22}\)

This is no mere theory. In the activation of the Charter in the case of Pakistan, VHR data were available—and in some cases already used—to monitor the areas affected by earthquakes. In spite of the clear emergency character of the context in which this took place, however, the United Nations authorities involved then requested all Charter participants not to use VHR data for fear to alienate the government of Pakistan in view of the potential impact on security or other crucial interests of Pakistan. Luckily, it turned out the Pakistani government took a relaxed approach and made it clear that, as far as it was concerned, VHR data could be used for the intended purposes, but it is very well possible that other countries in other circumstances would not be so relaxed about this.

All this, however, does not alter the fact that the “sensed state” neither has a veto to prevent it from being “sensed,” nor an exclusive, free or even merely preferential right of access to the data—and neither is it entitled automatically to becoming a partner in the relevant remote sensing operations.\(^{23}\) This becomes especially clear when these principles are seen in conjunction with Principle XII, since for the purpose of a particular set of remote sensing data—which geospatial information related or not—concerning its territory the “sensed state” is no different from any other state interested in such data.

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\(^{21}\) Resolution 51/122, 1996, Principles 2, 3.
\(^{22}\) Resolution 41/65, 1986, Principle IV.
\(^{23}\) Resolution 41/65, 1986, Principle XIII.
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Principle XII namely provides: “As soon as the primary data and the processed data concerning the territory under its jurisdiction are produced, the sensed State shall have access to them on a nondiscriminatory basis and on reasonable cost terms. The sensed State shall also have access to the available analyzed information concerning the territory under its jurisdiction in the possession of any State participating in remote sensing activities on the same basis and terms, particular regard being given to the needs and interests of the developing countries.”

In general it has not been considered “discrimination” when data disseminators—so far especially governments or intergovernmental organizations—apply different prices to scientific and/or noncommercial users on the one hand and commercial users on the other. Consequently, on a national or regional level distinctions are usually made between users from the scientific, educational or other evidently-public sectors (which normally have to pay nothing or only cost-based fees) and commercial users (who have to pay substantially higher, essentially commercial fees). Geospatial information data for emergency management purposes would squarely fall within the former category.

Also, where public authorities co-fund, subsidize or substantively support remote sensing activities, it seems obvious that they would have a right of access distinct from those of others to the resulting data, as this would not be tantamount to “discrimination” in the real sense of the word. However, due to the vagueness at the level of the principles contained in Resolution 41/65, national and regional implementation of this principle has taken place in many different ways.

The difference between primary and processed data on the one hand and analyzed information on the other hand is further noteworthy, in particular as geospatial information data would usually refer to either processed data or analyzed information (rather than to primary data as such). As to the first, a “sensed state” will only have access to the data concerning its territory if the “sensing state” or any entity for whom it is responsible is interested in marketing and selling those data—and then, of course, at the same (“non-discriminatory”) price and in conformity with the other relevant conditions. As to the second, the—already inarticulate—right of access (“as soon as” data have been produced) is further dilute; this time no time limit at all is provided for. Moreover, a right of non-discriminatory access for a “sensed state” exists only with regard to analyzed information in the hands of a “sensing state”—not, therefore, in the hands of any entity for whom it is internationally responsible. At least, that has been the interpretation to date of experts, states and international organizations alike.

Gradually, some practice is becoming clear in this respect. For example, whilst InfoTerra Germany has the commercial distribution rights of TerraSAR-X,

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24 Emphasis added.

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it has licensed (only) Japan to receive data, where Japan may opt to program TerraSAR to acquire data over North Korea. Thus, while the satellite owner in the last resort is Germany (more precisely: the German Space Agency, DLR, on behalf of the government), the commercial rights lie with InfoTerra and the operator (in the relevant region) is Japan — with the sensed state being North-Korea. This raises some legal issues, for example as to who is responsible for any “violation” of the Principles of Resolution 41/65, or any relevant rule of the Outer Space Treaty?

In terms of further legal parameters to the freedom to distribute remote sensing data, finally two further Principles contained in Resolution 41/65 are of special importance with a view to emergency response.

Firstly, Principle X provides: “Remote sensing shall promote the protection of the Earth’s natural environment. To this end, States participating in remote sensing activities that have identified information in their possession that can be used to avert any phenomenon harmful to the Earth’s natural environment shall disclose such information to States concerned.”

The clear moral value of this Principle, coupled with general duties of care, international cooperation and respect for benefit and interest of all countries, makes it rather difficult for states not to adhere to it, or even not to make private or other disseminators or users adhere to it. Thus, although directed again at states, and probably even in the absence of explicit obligations on the domestic/private level for disseminators and users, neglecting these provisions in disseminating or using remote sensing data might not be legally excusable on the international plane any longer. This might even mean that if a satellite operator has obtained satellite data that would clearly show global warming to lead to future degradation of the global environment, and such information is not duly transmitted to other states, it would violate Principle X.

Since, under Principle X, remote sensing shall promote the protection of the Earth’s natural environment, it may be asked what is included in that term “natural environment.” The Principle would not apply to “man-made environments,” certainly not according to the letter of the law. Since, however, the drafters of the text of the UN Resolution simply would not have had the possibility of dealing effectively at an international level with disasters in “man-made environments” such as factory explosions in mind, a development in interpretation could come to include such events. It is interesting to note from this perspective that the Charter does not limit itself so much to the “natural environment” as the UN Resolution does; thus, the train explosion in North Korea a number of years ago triggered the Charter into operation just as much as the tsunami did.

Secondly, Principle XI provides in a fashion rather similar to Principle X: “Remote sensing shall promote the protection of mankind from natural disasters. To this end, States participating in remote sensing activities that have identified
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processed data and analyzed information in their possession that may be useful to States affected by natural disasters, or likely to be affected by impending natural disasters, shall transmit such data and information to States concerned as promptly as possible.” The Charter, from this perspective, constitutes an institutional and structured elaboration of this Principle, and thus represents the next step to actually implementing it and making it work.

Principle XI largely mirrors Principle X; the latter dealing with man-originating threats to the natural environment of the earth, the former with nature’s threats against mankind. Consequently, the evaluation of Principle X largely applies here as well; for example, when it comes to the *prima facie*-focus on states possessing data, or as regards the vagueness of terminology, from which no actual conditions for disclosure can readily be distilled. Nevertheless, the obvious moral value of this Principle too would imply close-to-binding effects also upon non-state disseminators or users—at least it results in an international responsibility for relevant states to make sure these entities would adhere to the Principle. Both Principles, in short, clearly support liberal access to geospatial information data for emergency management purposes.

Finally, one noticeable difference with Principle X is that Principle XI explicitly applies to “processed data” in addition to “analyzed information,” as opposed to mere “information” as it is contained in the former Principle.

3.3. The Charter on Space and Major Disasters

Of major impact in the area of disaster and emergency response, the Charter on Space and Major Disasters was already briefly introduced *supra*. Prior to the Charter’s existence, generally speaking there was a lack of awareness on the side of the potential victims as much as of the providers regarding the potential usefulness of such data, coupled with a general attitude on the side of potential data providers of unease: what are my risks in terms of giving away valuable and/or sensitive data? How do others deal with such requests? How should I handle this? More in practical terms finally, there was no general system or format to handle any such requests; with the Charter there is at least such a system, with people and states knowing who has what role, and what they can normally expect when calling for help in this domain.

The Charter focuses directly and exclusively on the mitigation of major disasters and their harmful effects without creating any new international organization. It may therefore be said that it constitutes, so far, the sole international structured system for handling space-derived geospatial information data for emergency management. While there are no obligations to conduct geospatial information emergency management operations through the Charter, as such it clearly rep-
resists the most advanced context therefor, justifying extended discussion here. The Charter also represents a specific manifestation of such general principles of space law as pertaining to the benefit of all countries and the requirement to allow free and uninhibited access to data if natural or man-made disasters are at hand, as discussed above in the context of Resolution 41/65.25

The Charter, formally declared operational on 1 November 2000, aims at providing a unified system of space data acquisition and delivery to those affected by natural or man-made disasters. Formally, such information would have to be requested by the affected state, even if in practice it may (have to) end up in the hands of third states and relief organizations supporting the affected state, which might not even have the technical means to work with the satellite information. This would also raise some legal issues worthy of further discussion and investigation.

Each member agency has committed resources to support the provisions of the Charter and thus helps to mitigate the effects of disasters on human life and property: for example ESA provides data from ERS and Envisat, CNES from the SPOT satellites, CSA from the Radarsat satellites, ISRO from the IRS satellites, NOAA from the POES and GOES satellites and CONAE from SAC-C.

Article 6(1) of the Charter stipulates that requests to adhere to the Charter may be made by any space system operator or space agency with access to space facilities agreeing to contribute to the commitments made by the parties. In other words, it is a de facto prerequisite for membership to the Charter to possess capability to operate satellite systems; or at least to start doing so in the near future. Those space facilities are not necessarily limited to earth observation satellites or instruments; “space systems for observation, meteorology, positioning, telecommunications and TV broadcasting or elements thereof such as on-board instruments, terminals, beacons, receivers, VSAT’s and archives” are also included.26 Indeed, GOES and POES for example are meteorological satellites.

Upon request by a “beneficiary body,” the member agencies acquire the data on the area affected by the disaster from their satellites, process them into images, analyze them further if necessary, and distribute the resulting information free of charge to those states affected by the disaster via “associated bodies.”27 A state affected by disaster (or one intent upon coming to the rescue) that wishes to access

27 An “associated body” is “an institution or service responsible for rescue and civil protection, defense and security under the authority of a State whose jurisdiction covers an agency or operator that is a party to the Charter”; Art. 5(2), Charter on Space and Major Disasters.
relevant data needs to contact either associated bodies or “cooperating bodies”\textsuperscript{28} acting in partnership with an associated body.

The effective determination of which satellites should provide data for a particular disaster is to be facilitated by \textit{a priori} scenario-writing, although this seems to be largely theory so far. The partners agree to engage themselves in writing a range of scenarios to anticipate which data and information would be useful for different types of crisis. The parties shall together analyze recent crises for which space facilities could have provided or did provide effective assistance to the authorities and rescue services concerned\textsuperscript{29}, draw conclusions and prepare sample response plans for future events. The scenarios cover the issue of the type of sensors effective for specific disasters, and even more specifically include selection criteria for a specific satellite. Such scenario analyses save time when decisions are due with respect to provision of the most appropriate data to crisis victims, and hence facilitate rapid assistance.

A number of legal issues with respect to the operation of the Charter remain to be solved. The underlying point of note is that parties to the Charter continue to be obliged to follow all the international agreements they are party to, including those on copyrights, data access and liability as discussed in this contribution. The mere fact of signing a Charter, even if it would be fully legally binding, does not allow such signatories to ignore other international duties which they have to abide by.

In any particular case, one would have to look at which state, party to the Charter, has become party to which agreement, for if a state has not become party to an international treaty it is, basically, legally free to ignore its contents. In the case of the treaties dealt with in the present contribution, these include all or at least most of the Charter partners amongst their parties. If a state would consider that its obligations or interests with respect to the Charter would be interfered with by obligations resting upon it as the result of an international treaty, it could—within the terms of that treaty, e.g. as to a one-year-advance-notice—denounce its membership to that treaty, or announce that certain reservations would henceforth apply.

Services under the Charter are provided on a “best efforts” basis, implying that Charter members will take all necessary measures in rendering aid but do not guarantee successful results. A specific provision in the Charter waives the

\footnotesize{\textsuperscript{28} Cooperating bodies include the European Union, the UN Bureau for the Coordination of Humanitarian Affairs and other recognized national or international organizations with which the parties may have cause to cooperate in pursuance of the Charter. A “cooperating body” does not operate a space system but acts in partnership with an associated body which does; see Art. 3(5), Charter on Space and Major Disasters.}

\footnotesize{\textsuperscript{29} Charter on Space and Major Disasters, 1999, Art. 4(2).}
liability of satellite operators called upon to provide data under the Charter: “The parties shall ensure that associated bodies which, at the request of the country or countries affected by disaster, call on the assistance of the parties undertake to: “[…] confirm that no legal action will be taken against the parties in the event of bodily injury, damage or financial loss arising from the execution or non-execution of activities, services, or supplies arising out of the Charter”.30 So the member agencies would not assume liability arising from services offered under the Charter. Death cases are also subject to the waiver of liability, even though this is not stipulated specifically in the above clause.

This waiver of liability, however, does not comprehensively solve the problem. Firstly, since the Charter is concluded among the partner agencies but (obviously) not with all the potential crisis victims, the waiver of liability is not mutually agreed upon in any comprehensive sense. Therefore, certainly in those cases where the victim of a crisis is not (in) one of the countries to which the Charter partners belong, the unilaterally-declared waiver of liability raises questions as to its validity.

Furthermore, the Charter provides for a waiver of liability only concerning cases arising between the affected country and the Charter partners. It does not mention, for instance, cases arising from potential liability of intermediate actors with respect to Charter partners or countries affected by a disaster. The Charter does not stipulate whether such a state can assert a legal claim against intermediate actors directly, in case these are somehow involved in the damage being caused.

The above finally raises issues regarding the so-called “Good Samaritan” principle, a principle known in various national jurisdictions. This principle essentially means that a person who injures another in imminent danger while attempting to aid him (as long as not under an obligation to do so), is not to be charged with contributory negligence unless the rescue attempt is an unreasonable one or the rescuer acts unreasonably in performing the attempted rescue.31 Its purpose is to prevent people from being unduly reluctant to help a stranger in need, for fear of legal repercussions should they make some mistake in doing so.

The “Good Samaritan” doctrine has been used widely in different jurisdictions throughout the world. In Canada and the United States it is incorporated by means of specific acts. The principle is also reflected in different national laws of European states. If the rescuer has actually worsened the condition of the imperiled person many techniques are available to assess the rescuer’s conduct: from

mitigation of damages in Dutch law to the presumption of a low standard of care in French and English law. Since the “Good Samaritan” principle is incorporated into domestic law of many states, it is generally considered to reflect customary international law.

What it means in the context of the Charter, however, and whether its main criteria and parameters are overruled by it, remains an issue to be dealt with in further detail. For example, the principle is usually found to apply only when there is no specific (legal) obligation resting upon someone to come to the rescue. Are states or governmental agencies in the possession of relevant knowledge, alternatively of technological means to easily acquire such knowledge, however, not obliged to share such information? In other words, do the Charter partners qualify as “Good Samaritans” so as to be able to invoke this principle in their defense?

3.4. General humanitarian obligations

As already indicated, both the international space law-rules pertinent for remote sensing and the Charter on Space and Major Disasters are representations of a broader duty under general international law for states to assist other states and their peoples in cases of larger humanitarian disasters, whether natural or man-made. This excludes, understandably but of course very unfortunately, those man-made disasters created by wars, persecution and other forms of violence, since in particular those states where events in these categories take place are generally unwilling to have other states come to the rescue on humanitarian grounds.

Suffice it therefore here to make reference briefly to the existence of these underlying general humanitarian principles. Though they would apply also in cases not covered by either the international space law-regime or the Charter (whether ratione materiae or ratione personae), and as such would have a general bearing on a number of emergency response-related activities, their main disadvantage from a more practical perspective is their very broad and vague content. At every turn, a different set of issues and situations are at stake, making it very difficult to determine what, in any particular case, such general humanitarian duties would amount to in terms of, for example, concrete actions or measures.

For that reason, these obligations should be best perceived as obligations-of-effort, as opposed to obligations-of-result. Their practical reach remains to be determined for each specific instance, and in the last resort they may serve more as guidelines to prefer one course of action over another if, all other things essentially being equal, the one course would be more in tune with such humanitarian obligations.
3.5. Implications for emergency response purposes

Mirroring to some extent the copyrights issue, data access represents a major area of legal issues relevant for the present theme. For emergency response purposes especially the general international law regime on access to remote sensing data and the more specific requirements under the Charter resting upon key satellite operators should be taken into account. These regimes would considerably limit the discretion of any such key operator in deciding whether and how to distribute certain data.

Such limitations should essentially ensure that wherever geographical information becomes available that is of value for the purpose of emergency management activities—whether in the context of the Charter or not—of whatever nature (and perhaps, although this goes beyond the scope of the present contribution, also when not generated by satellites), it shall be made available without further ado for such purposes. Operators in the possession of such data, if worried that inappropriate use thereof might result from granting liberal access to their data, would do best to become part of the Charter-structure to the extent possible (if they are not already part thereof): even if also the Charter does not, as of yet, provide for a solid and general measure of protection against abuse, it is the only structure currently available where at least some protection can be enjoyed.

4. Responsibility and Liability Issues

4.1. State responsibility and satellite-based information for emergency response

A further (very general and in first instance abstract) aspect of basic importance concerns that of responsibility and liability under international (space) law. As for responsibility, the general form of international accountability, states are responsible in broad terms for ensuring that activities conducted on their territory or within their jurisdiction do not violate the rights of other states.32

In addition however to such state responsibility principles as they arise under general international law, Article VI of the Outer Space Treaty has caused a specific version of those principles to be applicable to space activities.33

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33 Outer Space Treaty, 1967, Art. VI.
activities, or more precisely “activities in outer space,” would certainly include everything from the operation of a ground station controlling (part of) a satellite system to the activities of the latter itself, up to the generation of any geospatial information data.34

Furthermore, Article VI of the Outer Space Treaty provides that states are internationally responsible for “national activities in outer space,” including cases where these are “carried on […] by nongovernmental entities.” This responsibility pertains to “assuring that national activities are carried out in conformity with the provisions set forth in the present Treaty.” States are thus responsible for activities undertaken in outer space in case these activities violate obligations under international space law. Moreover, states are responsible to the same extent for private activities as they are for their own, public activities—even, or perhaps more to the point: precisely—in the context of emergency management, in view of the clear public and humanitarian character of the relevant activities.

Whilst Article VI then begs the question: for which categories of private space activities is which particular state to be held responsible on the international plane, it would be beyond the purpose of the present article to deal with those issues. In any case, the answer to this question would lie in the interpretation of the key term “national activities.” However, no authoritative definition of the (scope of) “national activities” of a state for which it is to be held responsible has been provided by the Outer Space Treaty or elsewhere, and consequently no agreement exists as to the interpretation of this term. From the author’s perspective, the most effective and sound interpretation of private “national activities” would make states internationally responsible precisely for those activities over which they can exercise legal control.35 In other words: a state would be held responsible for those private activities that are undertaken from within its jurisdiction.

4.2. The concept of liability

When analyzing liability in the case of geospatial information products and/or services generated by satellites, one has to realize that again most of existing law and regulation is non-specific. Most of the legal environments further elaborating the concept, consequences and parameters of liability, moreover, are nationally defined, that is: operate within the territory of one particular state (only), even if (for example under space law) international regimes may be superimposed.

Liability therefore itself, as a concept and term used in numerous national as well as a considerable number of international legal regimes, may be differ-

34 Outer Space Treaty, 1967, Art. VI.
35 For further discussion see F.G. von der Dunk, Private Enterprise…
ently interpreted, applied and, in particular, further elaborated, in each case. The consequence thereof is that at the international level quite often a large measure of confusion has arisen as to the scope, meaning and consequences in law of that concept.

“Liability” has for example been defined as the “condition of being responsible for a possible or actual loss, penalty, evil, expense or burden,” and as “the state of being bound or obliged in law or justice to do, pay, or make good something” (Garner, 1999). For the purpose of discussion here, this may be restated as: “the accountability of a person or legal entity to compensate damage caused to another person or legal entity, in accordance with specified legal principles and rules and based upon specified sources of law.” Thus, liability depends upon a specific legal regime, which itself determines the boundaries of the particular liability regime at issue for example as regards where it applies, which persons or legal entities are involved on both sides of the damage (the causing respectively suffering side), what type of liability is provided for, how compensation is being dealt with, and suchlike.

Furthermore, the fundamental threefold distinction between contractual liability, non-contractual liability and product liability should be noted, leaving aside for the moment the question as to the extent in which each of those types of liability would actually come to be involved in the context of geospatial information supported emergency management activities. The key issue distinguishing the three different types of liability focuses on the legal relationship between the alleged victim of the damage at issue and the alleged responsible therefore—in other words: between the claimant and the defendant.

Contractual liability should be defined as “the liability which arises from a contract or agreement,” and thus deals with liability as between partners to a contract, regarding activities undertaken in relation to respectively damage suffered in the context of that contract and its subject matter. Black’s Law Dictionary, 295, and West’s Law & Commercial Dictionary in Five Languages, Vol. I, 339, define “contractual obligation” as “the obligation which arises from a contract or agreement.” “Contractual liability” is essentially a term coming from national law, and, by way of common denominator is explicit and formalized by way of the contract, already in existence at the time the relevant accident leading to damage occurs. Hence, for the purpose of analysis here it coincides in a principled sense with inter-party liability as it is often discussed on the public international level, where international treaties between states would essentially take the place of contracts.

From a legal point of view, dealing with contractual or inter-party liability is a matter of the freedom of parties to contract between themselves. This freedom may only—exceptionally—be restricted by an overriding public interest to en-
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sure that contracts are generally fair, if indeed such public interests are expressed through a law or other general statute.

Non-contractual liability, in view of the above definition of “contractual liability” then logically constitutes liability for damage occurring outside a contractual relationship, most prominently where the person or entity suffering the damage is in no way formally or contractually related to the person or entity causing it (or at least any damage caused would not be covered by any such formal or contractual relationship), and likely neither aware of the possibility of damage occurring nor able to take precautionary measures against it. Thus, it equates at this level of abstraction with the tort liability of national legal systems, respectively the third-party liability known in international law: its common denominator would thus be that the legal relationship is implicit, not formalized and solely based precisely on the fact that one party is the proven cause of the damage sustained by the other party.36

As a consequence, in contrast with contractual liability, protecting the interests of third parties through non-contractual liability regimes clearly in itself is a public matter, to be taken care of preferably by legislative means, since by definition bystanders cannot protect their interests themselves by contract or otherwise. Hence, this is also the type of liability which a public legislative document on the international level is most often concerned with. On the national level, this equates with the need for, preferably, a clear written law or statute, or—in common law countries—at least clear jurisprudence and customary law.

Product liability finally is defined as: “the legal liability of manufacturers and sellers to compensate buyers, users, and even bystanders, for damages or injuries suffered because of defects in goods purchased”.37 Thus, it is of a fundamentally different nature; not imposing liability upon someone for activities undertaken and damage suffered as a consequence, but imposing it upon someone having manufactured and/or sold a product by which, in the course of using it, damage has been caused. In a sense this constitutes an indirect form of liability, as the occurrence which triggers liability claims may take place (long) after the manufacturer or seller—the entity to be held liable—has had any involvement with the cause of the occurrence—the product. The relevant legal relationship here is effectively created through the product concerned.

36 “Tort” is defined as “a private or civil wrong or injury, other than breach of contract, for which the court will provide a remedy in the form of an action for damages” see A.B. Garner, Black’s Law Dictionary, Seventh Edition, pp. 1334 823; West’s Law & Commercial Dictionary in Five Languages, Vol. II, 1999, 47.

Also product liability, even if elements thereof may have found their way into contracts (on the sale of the product), in the last resort has usually been considered a matter of general public interests being preserved through the enunciation of explicit laws, statutes or (occasionally, that is: largely in the case of the European Union) international legal documents of a binding nature.

4.3. Contractual liability in the context of emergency response activities

For contractual liability, of course any analysis would only be relevant in as far as in the context of emergency response activities contracts would be required, for instance with satellite data providers. In any case, two main categories of contracts could be at issue: public contracts and private (commercial) contracts. In either case of course potential liability will at the primary level depend on the contract terms negotiated between parties. The claimant will then have to prove that the service or product provider did not comply with its obligations of providing certain data or services.

Further to that, however, a private entity’s contractual liability would be limited to the services and products it provides under the relevant contract, whether or not it would itself provide additional data or services downstream or confine itself to the provision of raw data only.

By contrast, some contractual relationships may be of a totally different nature since dealing with safety and security services: the value-added service providers would then (likely) be public entities or entities that benefit from public prerogatives justified by the fact that they are running a public activity. Hence these relationships would be more likely to take the form of public contracts, and be subject to public contract law, whether national or at a European level.

The most important thing to note, however, is that such contractual liability does neither deal with any damage caused to those victimized or threatened by the emergency situation at issue, nor at the other end with damage caused to those trying to come to the rescue. Thus, it is an issue perhaps not of primary relevance in the present context.

4.4. Non-contractual liability in the context of emergency response activities

The main element of non-contractual liability to be discussed here, in the context of victims of emergency situations and addressees of emergency response activities, concerns the issue of “negligence” involved in the provision of relevant data and services. Which activities in the present context could or would qualify
as a negligent public act or negligent omission, and if so, what would that mean in terms of liability? The United States’ National Oceanic and Atmospheric Administration (NOAA) has already been taken to court for its “failure” to warn (adequately) against the December 2004-tsunami. Would there be an inherent obligation to provide certain guarantees? Or would it be lawful to waive or disclaim liability for (absence of) provision of relevant guarantees?

States under international law assume a certain responsibility for ensuring that relevant activities conform to rules of international law. States may not be held liable automatically at the international level, unless this has been expressly provided for in a treaty somehow applicable to the matter. Nevertheless, relevant operators or data providers might remain liable for negligence under national law, though one would have to study such relevant national laws in considerable more detail before more substantive conclusions would be feasible.

One specific regime at the international level meriting to be mentioned here concerns that of international space law. As far as direct physical damage caused by space activities is concerned, this is ruled by Article VII of the Outer Space Treaty, further elaborated by the Liability Convention. This regime provides for liability for damage caused by a space object resting upon the “launching State(s)” of that space object; the concept of “launching State” being defined in a fourfold fashion. The term “launching State” means: (i) a state which launches or procures the launching of a space object; (ii) a State from whose territory or facility a space object is launched.38 It may be noted once more, that such state liability would apply regardless of whether the actual operation causing the damage was privately conducted or even if the whole satellite venture would be a private one.39

This is, however, not the whole story when it comes to liability for satellite activities in the context of emergency response. The international space law regime for liability is only relevant for damages caused by a satellite physically harming another space object or causing terrestrial damage—arguably even restricted to such damage caused by physical impact, that is a crash. In the case of emergency response, while this is not a negligible issue, attention also needs to be paid to the possible damage caused by the user of data or information, for example when that user, wrongfully trusting the data and services provided to him, causes damage which may in turn trigger other liability regimes to become applicable—with the user being held liable for such damage! Such other liability regimes may be both of a very general nature—tort or wrongful act—or of a more specific nature, yet still (arguably) applicable. In this context finally the “Good Samaritan” principle once more may play a role in determining ultimate liabilities for damage occurring.

38 Liability Convention, 1972, Art. I(c).
39 See F.G. von der Dunk, Private Enterprise...
4.5. Product liability in the context of emergency response activities

Finally a few words on product liability in the current context. The generation and distribution of emergency response data and other products could involve product liability claims against the relevant providers. Two aspects of such activities are actual candidates for product liability suits: the equipment used to generate, transmit or receive data, and the data products themselves. Existing product liability law was, of course, not at all designed for such activities, and considerable lacunae and inconsistencies might arise when applying it to them nevertheless. It may, once more, be illustrative to zero in on the European context as established within the European Community legal framework, to illustrate how product liability law might be applied in the context of emergency response.


Further to this general rule, the Directives contain the following main elements: liability without fault of the producer; burden of proof on the claimant as to the damage, the defect and the causal relationship between the two; joint and several liability of all the operators in the production chain, providing a financial guarantee for compensation of the damage; exoneration of the producer when he proves the existence of certain facts explicitly set out in the Directives; liability limited in time by virtue of uniform deadlines; and illegality of clauses limiting or excluding liability towards the victim.

The Directives allow member states to derogate from the common rules adopted with regard to three issues: (1) to include unprocessed agricultural products in its scope of application; (2) to not exonerate the producer even if he proves that the state of scientific and technical knowledge at the time when he put the product into circulation was not such as to enable the existence of a defect to be discovered; or (3) to fix a financial ceiling of not less than €70 million for damage resulting from death or personal injury and caused by identical items with the same defect.

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This is, of course, the general regime for product liability within the European Union. Applying the Directives to products generated in the context of emergency response activities would be subject to a number of criteria being fulfilled. This concerns: (1) whether an emergency response data product will qualify as a product under them; (2) the extent to which the claimant is able to establish a defect in such product; (3) the extent to which the claimant is able to establish the alleged damage and the causal relationship between the defect and the damage; (4) establishment of the fact that a relevant entity is the producer within the meaning of product liability law and the Directives in particular; and (5) whether that producer has any justifiable and recognized defense.

In view of the liability cap in the Directives, and the prescription and liability periods introduced, it is possible, particularly in jurisdictions where contractual liability or general law of negligence offer better opportunity to him, that a claimant would choose alternative avenues for claims. This possibility is left open by the Directives; they shall not affect any rights which an injured person may have according to the rules of the law of contractual or non-contractual liability, or a special liability system.

4.6. Summarizing: the liability issue and emergency response

The effect of the liability issue on emergency response activities should not be underestimated. The willingness to undertake such activities would, after all, be considerably lessened if liability claims would be possible at each and every turn. Relevant partners will face a number of non-contractual liabilities where there would be little opportunities to fundamentally deflect or alter such liabilities—and consequently will have to somehow face them and deal with them.

In the field of contractual liabilities, by contrast, relevant operators and information providers have a large discretion to determine the extent of such liabilities. Thus the question from the other end arises to what extent these would be prepared and willing to accept liabilities.

In terms of product liability finally, as was illustrated by the EU example, regimes may exist that have a bearing on emergency response products also, subject to a number of criteria being fulfilled.

It is beyond the scope of this contribution to develop further details on how to handle liability in the case of emergency management using space-based geospatial information data. To start with, more experience needs to be had with relevant operations somehow resulting in damage (rather than mitigating it), and how the resulting, conflicting interests were handled in practice. More importantly, probably, an analysis would then be necessary of the ways in which liabilities, and such more specific concepts as the “Good Samaritan” principle, are elaborated and developed.

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implemented within the national jurisdictions at least of the major countries and as representing the major legal systems of the world.

5. Security and Dual-Use Issues

5.1. The Wassenaar Arrangement

The Wassenaar Arrangement is a global, formally non-binding arrangement on export controls for conventional weapons and sensitive dual-use goods and technologies. It was designed to promote transparency and greater responsibility in transfers of conventional arms, dual-use goods and dual-use technologies. Participating states commit themselves to ensure through national policies and, where appropriate, regulations that cross-border transfers of these items do not contribute to the development or enhancement of military capabilities of other states.

The decision to allow or deny transfer of any item, however, remains the sole responsibility of each individual state. Thus, export controls differ from state to state (in terms for instance of documentation required, license fees, length of time to get a license, and duration of validity of the license).

The participating states only agree to notify transfers and denials, as well as to control all items in the List of Dual-Use Goods and Technologies and the List of Munitions, annexed to the Arrangement. Controls do not apply to technology or software in the public domain, to basic scientific research or to the minimum necessary information for patent applications. The Lists have two annexes of sensitive items and of very sensitive items respectively, to which different levels of control should be applied, and are reviewed regularly to reflect technological developments.

The participating states finally agree to exchange general information on risks associated with transfers of conventional arms and dual-use goods and technologies in order to consider, where necessary, the scope for coordinating national control policies to combat these risks.

44 Wassenaar Arrangement, 1995, Art. II(3).
45 Wassenaar Arrangement, 1995, Art. II(4), III(I), Appendix 5.
46 Wassenaar Arrangement, 1995, Art. IV(1).
As to emergency response activities, subject to further analysis but above all experience, some of the products and services envisaged in their context might turn out to be, explicitly but especially implicitly, included in the relevant List. If so, the question arises what could be done about that and about the resulting potential obstacles to distribution of relevant satellite-generated information.

5.2. Regulation 1334/2000

The Wassenaar Arrangement as such does not recognize the European Union in any substantive manner. Partially as a result thereof, within Europe the same issue was also dealt with in a more classical, legally binding format by means of Regulation 1334/2000, which sets up a regime for the control of exports of dual-use items and technology for the EU member states.\(^47\) An authorization is required for export of the dual-use items listed in Annex I (which is essentially similar to the Wassenaar Arrangement’s List of Dual-Use Goods and Technologies). If the prospective exporter is aware that an item, even if it is not listed in Annex I, might be used in a way proscribed by the Regulation, it is still bound to apply the applicable provisions.\(^48\) Under the Regulation export is defined to include transmission of software or technology by electronic media, fax or telephone to a destination outside the Union.

As with the Wassenaar Arrangement, under Regulation 1334/2000 the responsibility for deciding on applications for export authorizations lies with the national authorities. Some items on the List of Dual-Use Items and Technology (Annex 1) are not controlled if they accompany the user and are for the user’s personal use: Regulation No. 1334/2000 “does not apply to the supply of services or the transmission of technology if that supply or transmission involves cross-border movement of natural persons”.\(^49\)

The Regulation establishes a Community General Export Authorization (CGEA) as set out in Annex II for certain exports. Annex II, Part 1, specifies that the CGEA is possible for all dual-use items listed in Annex I, except those specified in Annex II, Part 2, dealing with the more security-sensitive items. National export authorities are not automatically obliged to provide a CGEA, however, and, in any event, the exporter must comply with certain reporting requirements, as set out in Annex II, Part 3.

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\(^49\) Regulation 1334/2000, 2000, Art. 3(3).
For all other items, authorization shall be granted by the member state where the exporter is located.\textsuperscript{50} This authorization may be an individual, global or general authorization. Member states must maintain or introduce in national legislation the possibility of granting a global authorization to a specific exporter for dual-use items valid for export to one or more specified countries. The competent authorities may refuse to grant an export authorization and may annul, suspend, modify or revoke an export authorization which they have already granted. Exporters are required to keep detailed records of their exports.

Once more, with a view to emergency response activities, the Regulation may turn out, under its present status and contents, to unduly obstruct the distribution of some of the relevant products and services. This ultimately depends, of course, upon the extent to which those products and services may, prima facie, be seen as dealing with dual-use and/or sensitive software or information.

5.3. The United Nations system for international security

For completeness’ sake, it would be appropriate to refer here briefly to the general global system for dealing with international security issues, as developed in the context of the United Nations. The United Nations under the UN Charter has been given the major task by the member states to try and establish alternatively preserve international peace and security, using the various competencies allotted to it.\textsuperscript{51} Those competencies in particular rest with the UN General Assembly, which has the possibility to issue (non-binding) Resolutions as well as a role in dispatching peacekeeping or peace-making forces, but especially with the Security Council, which has the power to issue binding Resolutions in this regard.

Under this system, the Security Council may, for example, impose boycotts, economic blockades or even authorize full-fledged military actions if it considers international peace and security sufficiently threatened.\textsuperscript{52} Throughout the last decades, these powers have been used in such cases as Yugoslav civil wars \textit{vis-à-vis} Serbia in particular, the Iraqi invasion in Kuwait in 1990, and the military actions against Afghanistan in 2002 and Iraq in 2003.

The main point to keep in mind for emergency response activities is that, should any such measures be imposed by the Security Council in the future, the relevant operators and geospatial information providers would be bound to comply with them as well. It could be imagined in particular that certain data products or services would not be allowed to be delivered to certain parties, or that certain

\textsuperscript{50} Regulation 1334/2000, 2000, Art. 6.
\textsuperscript{52} UN Charter, 1945, Art. 41,42.
international cooperation ventures with certain parties would have to be suspend-
ed or cancelled in cases where the Security Council would determine a threat to
international peace and security to exist.

In such an event, a close reading of the actual decision by the Security Council
would be requisite, since it will have to draw a very delicate balance between the
political needs behind for example the suspension or cancellation of international
cooperation and the obvious humanitarian needs resulting from the disaster at is-
sue requiring geospatial information for alleviating the disaster’s consequences.
A comparison with the “Food for oil” program of the United Nations vis-à-vis
Iraq at the time Iraq was already being internationally isolated in punishment for
its refusal to comply with inspections of their purported facilities for weapons of
mass destruction would be illustrative from this point of view.

5.4. Summarizing: Security issues and emergency response

Discussion of issues of security and dual-use character in the context of emer-
gency response activities is not that farfetched. Data generated by those activi-
ties or information based on such data, could very well be found to be subject to
the legal regime, summary as it may be, applicable to international trans-frontier
movement of security-sensitive information or become involved in international
actions trying to preserve international peace and security.

It would therefore sooner or later be necessary to address these issues in more
detail: analyze those situations where the issue has, or could have, come up, and
then offer further suggestions to ensure that security interests and the humanitar-
ian interests of emergency response are fairly and transparently balanced. For ex-
ample, in the context of the Wassenaar Arrangement (and for Europe Regulation
1334/2000) exceptions could be drafted here necessary to enhance the clarity of
what is, and what is not, appropriate in any given case of geospatial information
supported emergency management involving potential security interests.

6. Final Remarks

Maybe the above, first analysis raises more legal questions than it provides
answers. This is, however, no doubt due to the novelty of the issue of emergency
response on such an international level and with the fundamental involvement of
satellite technology. To reiterate, one would need considerably more and deeper
analysis, but in particular experience with legal, pre-legal or para-legal discus-
sions and disputes, before any thorough discussion of the many issues specific to
geospatial information data derived from space and used to support emergency
management operations could be undertaken. It may perhaps come as an unwel-
come surprise that such activities, normally undertaken with the best of intentions, might be subjected to legal scrutiny and run into legal obstacles or at least raise legal issues which may make potential rescuers think twice before doing the seemingly obvious.

Nevertheless, major legal issues (and in their wake also organizational ones) can indeed already be seen to arise, as the above has hopefully demonstrated, and precisely in order to ensure that the best intentions are allowed maximum leeway whilst undesirable side-effects are mitigated or even, preferably, ruled out, work should be done to solve those legal issues in the most appropriate way. In a number of respects, moreover, the European situation is particularly relevant and/or illustrative, in view of the fundamental legal developments taking place in the EU context and the extended legislative opportunities to deal with issues relevant for emergency response.

It is all about balance. A proper balance will have to be found for example between justified interests of a copyright owner in protecting his intellectual property regarding certain data products useful for emergency response action and the obvious public interest in allowing such data products to be, in essence, so used. Similarly, interests stemming from security perspectives should not unduly hinder humanitarian efforts to respond effectively and swiftly to disasters or emergencies. The attendant responsibilities and liabilities, which will not of themselves go away by the mere fact of an action being of a humanitarian, emergency-response related character, will have to be distributed appropriately.

In view moreover of the international character, both of many of the major emergencies and disasters and of the use of satellite images to try and deal with them, such a balance should preferably have a strong international component. While there is no denying the relevance of national interests and national sovereignties in today’s world in spite of creeping globalization, and many legal issues cannot but be solved at a national level, a certain international understanding based on sound international—read essentially inter-state—agreements seems to be indispensable.

Actually, the Charter on Space and Major Disasters represents the, so far, furthest step in that direction. Without creating as of yet an institutional structure or even undisputed legal obligations, it has brought into focus the serious and substantial willingness of a number of satellite operators to (allow others to) use geospatial information generated by their satellites for overly humanitarian purposes. The almost weekly growing number of Charter activations moreover show that the practical value of such constructs for many is not at issue anymore. Finally, from the perspective of international law it is very interesting to note the range of states having so far triggered—or at least grudgingly accepted—activation of the Charter since threatened by or suffering from major disasters: developing countries as
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much as developed ones, from the South to the North, from the East to the West, literally from the United States to North Korea (in which last case it actually was the United Nations Office for Outer Space Affairs that activated the Charter).

All this means that global acceptance of certain duties cannot be far, and that seems to predict a bright future for further efforts to clarify the legal issues that need to be solved—such as those elucidated in the present contribution. It certainly means that using satellite-generated data and information is considered to be a prime example of the “benefits and interests” of mankind and all countries, which Article I of the Outer Space Treaty posits as one of the legal cornerstones of all usage of outer space.
Chapter IX. Geospatial Information: Emerging Liability Issues

1. Introduction

It is generally understood that ‘liability’ is a harm-based concept in that one may be ‘liable’ if one causes someone an injury or loss. However, another interpretation may be that the injury to others and such losses may be minimised if one is aware of the risk and knows the potential causes. In this vein traditional tort liability theories suggest the related concepts of a duty of care, the breach of such a duty, the proximate cause of the breach and loss or damage if there is to be any liability. This contribution aims to address the emerging issues of tort liability with the use of geospatial information and how harm by way of injury or loss is addressed and mitigated in the digital environment. There are emerging trends in liability with the advent of the Web 2.0 landscape together with the more ubiquitous ‘application’ (apps) of mobile electronic devices. In addition, net-citizens (netizens) who contribute to the collection, use and dissemination of geospatial information have triggered a re-evaluation of traditional legal frameworks. The legal and policy framework faces an uphill challenge to adapt to this environment and to produce novel solutions for the digital age.

An introductory discussion outlines some emerging trends in the Web 2.0 and apps environment followed in part two which addresses the legal and policy framework that sets out the parameters and criteria for tort liability related to geospatial information backgrounded with adaptations and emergent challenges. Part three focuses on the ‘G’ in geospatial information and data, in particular a discussion on data quality and accuracy and the key issues that will play a lead role in discussions on this topic of geo-liability. Part four examines issues related to dynamic geospatial information, namely those produced by global position systems (GPS) and the advent of augmented reality (AR) that may be used as a supplement to the static data geospatial displays. Part five is about crisis mapping in the form of crowd-sourced mapping and the rights and responsibilities of ‘citizen sensors’ who contribute to the volunteered geographic information (VGI) movement. Part six reviews the storage of information in the cloud resulting from advances in cloud computing (CC) which may have profound impacts on geospatial information and legal liability issues. A concluding section draws these threads together to
chart what kinds of policy and legal responses could emerge. A proposed review of the legal and policy framework may produce a ‘relational law’ that addresses the technology, network governance and legal protections for users, producers and custodians of geospatial information.

The ‘G’ in geographic information systems (GIS), global positioning systems (GPS), Google Earth™ provide the starting point for this discussion. According to the United Nations Global Geospatial Information Management report “everything happens somewhere” (UNGGIM 2013:11). Geography, it seems, is everywhere and ubiquitous. One cannot escape geospatial omnipresence in everything one does even in the voids of Outer Space where every position is referenced by sets of co-ordinates in time and space. In the Web 2.0 environment the Internet is an integral part of the technological infrastructure. Here the static pages of web sites are used and updated by collaborative and cooperative means by users for dialogue, creation of content, and the meeting online of a virtual community. But, the World Wide Web as envisioned by Sir Tim Berners-Lee as “a collaborative medium, a place where we [could] all meet and read and write” continues however.¹

‘App’ – listed as the 2010 word of the year – is a mobile application software designed for smartphones, tablet computers and other mobile devices. Apps are available through application distribution platforms operated by owners of mobile operating systems. Initially launched for general purposes and information retrieval, it has expanded to include other uses such as mobile games, GPS and location-based services including banking and order-tracking parcel delivery systems. Apps appeal most to those systems where the user context in terms of location and time of day is paramount – hence explaining its popularity among location-based services and GPS users because context hinges on geography and time. The combination of location and time introduces the ‘dynamic’ element to the ‘G’ discussed above.

While the Web 2.0 environment is one where communication takes place anytime and anywhere it challenges traditional legal and policy framework world wide. The governance of Web 2.0 activities will invariably be a place-based location where ‘jurisdiction’ becomes pre-eminent and the law of the land prevails. Unless specific laws have been developed to govern electronic-based activities the existing law and regulation is adapted to cater for and address the challenges. The adaptation could be by way of analogising case by case or re-writing rules and regulations for ‘special or exceptional cases’.

2. Legal and Policy Framework

The conceptual framework for tort liability under the civil law systems and the common law world is nearly the same in that harm is to be prevented but that where it does occur then the harm has to be rectified. Under the civil law system originating in Europe core principles are codified and are the primary source of law. On the other hand, the common law in the United Kingdom and Australia derives its authority on precedence and prior court decisions. The legal liability referred to here is the subjection to a legal obligation and indeed to the obligation itself. In the language of the law one becomes “liable” or incurs a legal liability when one commits a wrong or breaks a contract or trust. The sanctions flowing from legal liability may either be civil or criminal according to whether it is enforced in a civil or criminal matter and court of law in which it is enforceable. Creating, providing, distributing and using geospatial information may attract obligations of a legal nature. For creators, providers and users of geospatial information, legal liabilities may stem from a failure to fulfil or comply with the term of a written or oral agreement through to wrongful acts (torts) including the failure to act and causing another party to suffer harm, economic loss or damage.

Contractual liability arising from a contract for the provision of a geospatial service may often specify a quality standard, for example, the scale, resolution, or accuracy to some national or international benchmark. How the contract is fulfilled, such as the type and quality of the media on which the data, product or service is to be delivered or maintained, the time of delivery including the updating of the data, and the privity of the contract or the exclusivity of the data may be other terms of the contract for which a provider or vendor must fulfil in order to avoid being sued. Privity is the connection or relationship that exists between two or more people who have entered into a contract. Vendors who supply data that is known to be inac-

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Chapter IX. Geospatial Information: Emerging Liability Issues

curate, incomplete or misleading and which might negatively impact on persons or property could raise a tort liability. Similarly users of geospatial data may become subject to legal obligations to the provider or vendor when they fail to comply with provisions of the contract or use the geospatial products beyond the intended uses outlined in the contract. Examples of usage beyond the contract include using data incorrectly, whether intentional or otherwise, that may create a tort liability.

Tort liability arises from the principles such as a duty of care, the breach of which leads to economic loss, damage to property and/or injury to persons. Tort liability, in the geospatial information context, arises when the provider, vendor or user of that data directly causes harm, economic loss or damage to the property of others. Hence, making decisions based on inaccurate geospatial data or providing error-riddled geospatial data may result in a tort liability. A failure to check and correct errors is considered to be negligent. The misuse of accurate geospatial information may also be deemed a legal wrong when a loss or harm is the result. Other examples include a vendor representing the suitability of a dataset or a user extending geospatial information interpretations beyond what the data were capable for. Thus, legal liability risks are very high when using geospatial information of unknown heritage, with unknown error ranges, poorly articulated standards of accuracy, and using undefined attributes. Equally, one may be made responsible for errors of judgement, measurement and interpretation.

Negligence as a tort liability may arise under certain circumstances. The law of negligence protects people and their property from the careless behaviour of other members of the community. To succeed in an action of negligence there must be a duty owed, a failure to observe that duty and damages or loss suffered as a result. Hence a person is deemed negligent when that person falls below the standard of care which a “reasonable person” (for example a prudent driver of a motor car) placed in the same circumstances would have observed. An intentional misrepresentation of facts is deemed to be fraudulent for which legal sanctions can be severe. Examples where providers or vendors of geospatial information products could be exposed to either type of liability is representing that the data provided are error-free or that the data are of a particular standard. In using data from GPS, for example, the specification of the data standards, known biases and error sources should be carefully documented. Negligence may also arise from carelessness and recklessness. Negligent misstatements as well as unintentional acts including those of omission attract legal censure.4


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Map liability arising from the use of geospatial information may emanate in particular circumstances. Geospatial information mapping generates its own set of potential legal liabilities, for example, map errors in general, poor map designs, and aeronautical charts that show perspective views rather than the more usual and expected overhead views. In *Aetna Casualty & Surety Co. v Jeppsen & Co.* \(^5\) a court found Jeppsen strictly liable for producing a defective approach procedure chart that contributed to a plane crash. The U.S. Federal Aviation Administration (FAA) designed and published an instrument approach procedure for airports throughout the country in tabular form; Jeppsen charts the FAA data to represent the approach procedures in graphic form. Jeppsen had improperly depicted the data by presenting the airport approach procedures at two different scales. The Court found that the pilot’s reliance upon the defective chart caused the crash. Similarly, in *Brocklesby v United States* \(^6\) the court found Jeppsen strictly liable for its defective approach procedure chart even though the defect may have arisen from allegedly inaccurate FAA data. The court held the chart producer had assumed the responsibility for insuring that the charts were not dangerous in their intended use.

Maps can also be used in inappropriate ways that were unintended by the cartographer. Here, unless the limits to which the maps may be used were clearly stated, a user must be very careful in map interpretation and analysis so as to avoid contributing to the negligence, technically known as ‘contributory negligence’.\(^7\) The limits to be aware of include the map projection, map scale, and the origins of the data. Where claims are made, courts sometimes inquire into the map construction process and data entry procedures. Careful attention to data entry, checking for errors and consistency in use of data sources will help minimize the risks and costs of litigation awards.

In assessing liability and to discover ‘whom to blame’, most courts use a “reasonable person” test in which the actions of a hypothetical, rational, reasonably intelligent person representing the average citizen is applied. For the sale of geospatial information, the responsibility remains with the supplier even if the geospatial information is sold by intermediaries to third parties without disclaimers and warranties. The supplier is still deemed to be responsible for the subsequent loss or injury. It should be noted that under tort law, innocent third parties buying and using geospa-

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\(^5\) 642 F.2d 399 (9th Cir. 1980).

\(^6\) 767 F.2d 1288 (9th Cir. 1985).

\(^7\) In Australia contributory negligence is a complete defence to a claim of negligence under tort liability but not under a contract. There are legislative provisions that provide for the apportioning of blame. See *G. Cho, Geographic Information Science: Mastering…*, pp. 374ff. Contributory negligence Polish law is discussed by *J. Winiarz, Ustalenie wysokości odszkodowań* (Determining the Amount of Damages), 1962, pp. 90-108.
tial data and services without checking details of the veracity of the data or vendor claims may be held responsible for any subsequent loss or damage.

Geospatial liability may be prevented and indeed be minimised where disclaimer statements are made on the product or service provided. Disclaimer statements to avoid liability could include text such as those used by the Ordnance Survey (OS). “The Information is licensed ‘as is’ and the Information Provider excludes all representations, warranties, obligations and liabilities in relation to the Information to the maximum extent permitted by law. The Information Provider is not liable for any errors or omissions in the Information and shall not be liable for any loss, injury or damage of any kind caused by its use”.

Further statements concerning the derivation of the geospatial data, the responsibilities of the data user may illuminate the limits to which the data may be deployed. Usually in such circumstances the vendor could make a disclaimer stating that no warranty, whether expressed or implied are given regarding the accuracy, reliability or completeness of the data. It is usual for such a disclaimer to state that all geospatial information is provided “as is” without warranty of any kind, either expressed, implied or of a statutory nature including merchantability and fitness for purpose. Here, users assume the entire risk concerning the quality and performance of the geospatial information. In addition, users are required to agree to defend, indemnify and hold harmless the supplier of the geospatial information from and against all suits, losses or liability of any kind including all expenses. In practice, as long as there is due diligence, no legal liability attaches. Due diligence simply means the taking of care by vendors, providers and users of geospatial data. Most geospatial information databases contain some degree of error and omission and whilst this is recognised, the courts will make liable those vendors, providers and users responsible who had a duty to prevent damages but failed to do so. Disclaimers could be invaluable to prevent litigation and there may be little need for a contractual relationship to exist.

3. The ‘G’ in Geospatial Data and Information: Quality and Accuracy

The question that is often asked when speaking of the ‘geography’ contained in geospatial data and information is its quality and accuracy when depicted on topographical and other map products. Equally a similar question is also asked: “how accurate is my GPS unit”. The answer invariably in most cases is: “... it

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9 See the discussion on indemnities and due diligence in G. Cho, Geographic Information Systems and the Law. Mapping..., pp. 134 ff.
depends – on context, scale and application.” The coordinate readings from GPS units depend to a great extent on whether it is of survey quality or whether it is for in-car navigation purposes or whether it is for general purpose use. Each of these subscribe to different needs, specifications and technical standards. Hence the readings from GPS compared to those from, say Google Earth, community parcel cadastral databases, topographic maps and digital nautical charts will all vary in terms of the degree of accuracy and precision. The bottom line it seems is that it all depends on scale, is relative and can be arbitrary.

There is a difference between what is referred to as accuracy and what is deemed to be precise. While both attributes are desirable since accuracy measures show how close an observation is to the true value precision refers to the consistency of a measurement method.10 The U.S. Federal Geographic Data Committee (FGDC) has described a standard for measuring and reporting positional error. Positional accuracy is an important characteristic for every digital data set. This standard is known as the National Standard for Spatial Data Accuracy (NSSDA) to assist in accuracy assessment.11 Accuracy assessments may then be cross checked against the National Geodetic Survey (NGS) in order to determine the coordinate of a point accurately.12

Sometimes one reads of cases of drivers in vehicular collisions or accidents claim that “the GPS unit in the car instructed me to do so”. The defence may seem counter-intuitive, uncommon sense and laughable – but is it? Is there a case against the GPS provider rather than the user? First, the GPS instrument might have been inaccurate in providing directions to the intended destination. Next, the user could argue that s/he was entitled to rely on the accuracy of the provision of a navigational service. Where then does the responsibility lie? In contractual terms it is likely that the user would have to accept a disclaimer by the instrument maker. It would also require the user to ensure that the instrument is used in a proper and safe manner despite what the GPS device might instruct the user to do. The question here is whether the disclaimer makes the contract enforceable.

On the other hand, a GPS service provider could argue that users must take much more care and responsibility in using GPS units. Absent the GPS, users would have to manually and independently plan a route to get to a destination. Today, even with the assistance of a GPS unit, operators must take some responsibility and not pass the blame on the GPS provider when accidents happen. It

is also arguable that when using the GPS in unfamiliar territory and on being given explicit instructions by the GPS receiver, a user must make instantaneous decisions and it is not unreasonable that the user relied wholly on the GPS unit. Airline pilots however, have no choice but to follow the GPS instructions explicitly, that is, apart from audio commands given from a control tower.\footnote{See this discussion in E.J. Sinrod, Is GPS liability next?, Cnet News, 2008, at http://www.news.com/Is-GPS-Liability-next/2010-1033_3-6226346.html, as of 28 January 2014.} But, the issue of who is liable in tort law has yet to be unequivocally resolved and remains a live issue.

A heavy reliance has been placed on GPS – the generic system pioneered by the U.S. Department of Defense in 1973 based on a constellation of satellites to provide reliable positional information for military applications. GPS and Navstar are names used interchangeably but GPS commonly refers to the positional system. Indeed there have been developments elsewhere especially with a Russian global navigation satellite system – GLONASS, the Chinese Compass navigation system also known as Beidou-2 (BD2) and the European Union GALILEO systems launched in 2007. Manufacturers of GPS units rely on either one or a combination of these systems to provide positional and timing data. It may be contemplated that there is a slim possibility of a failure of the satellites. Also a service provider may fail when tracking system network shuts down and users might have to seek alternative providers. The suggestion is that liability risks loom large despite the availability of geospatial data through such systems. Additionally, it may appear that positional data appear to be short-term and ephemeral in nature when compared with hardcopy paper maps. The lesson is that before the systems break down there is a need to know where liability risks lie.

Sometimes the positional readings given to users of GPS units might be totally incorrect or the users might not have noticed because of their over-reliance on the use of technology that has replaced ordinary common sense.\footnote{R.G. Satter, GPS sends ambulance 200 miles off-route, 2006, at http://www.usatoday.com/tech/products/gear/2006-12-07-gps-fault_x.htm, as of 28 January 2014; and J. Banard, Couple stranded three days after GPS leads them astray, 2009, at http://www.usatoday.com/tech/news/2009-12-28-GPS-stranding_N.htm?csp=Tech, as of 28 January 2014.} In extreme cases where position is vital as lives might be at risk, the U.S. Federal Communications Commission (FCC) has mandated that companies using ‘network’ technology emergency 911 (E911) calls provide positional data to be within 300 meters of a caller 95 per cent of the time. The cell phone network technology uses triangulation among cell towers to determine a caller’s location. E911 is a North American telecommunications based system that automatically associates a physical address with the calling party’s telephone number, and routes the call to the most appropriate Public Safety Answering Point (PSAP) for that address. The caller’s address...
and information is displayed to the call taker immediately upon call arrival. This provides emergency responders with the location of the emergency without the person calling for help having to provide it.\textsuperscript{15}

While the previous discussion is about finding people using GPS devices, there are times when one may not want to be found. The issue of locational privacy is growing and may feature prominently especially where hand-held devices such as 3-G enabled GPS, iPhones and iPads provide geo-location information and others in the form of geotags in social networks. Geotag information may be given out either consciously or inadvertently. Hence, location-based services (LBS) social networks such as MySpace, Foursquare, Gowalla, Goggle Buzz, Facebook Places and Brightkite may be forced to address the issue of infringing privacy laws. The question is more than simply an opt-in or opt-out one and it is unresolved territory.\textsuperscript{16}

At other times one might wish to use the GPS data as a shield so as to provide the evidence of having been at a certain place and a certain time. Will one’s location-aware device be able to be used to prove one’s whereabouts if one is the focus of litigation? This possibility might arise at a car accident and to use location information to provide the alibi. The potential of applications are rife. However, most legal evidentiary rules suggest that to use the GPS device in such a manner would require that the device be thoroughly tested, much like speed cameras and speed radar to log speeding cars, before the evidence obtained may be admitted in court as evidence or proof of alibi.\textsuperscript{17}

But there are limits as current regulations may prohibit the installation of surveillance devices in cars and trucks to check on locations, speed and anti-theft vehicle security. In one case Telstra Australia attempted to install GPS surveillance devices in its corporate vehicle fleet but was barred by the courts from doing so because of a lack of genuine consent of its employees as well as a breach of certain statutory provisions, for instance, the \textit{Surveillance Devices Act} 2004 (Cth) as well as the \textit{Occupational, Health and Safety Act} 1991 (Cth) legislation. Surveillance equipment has been claimed to have caused some employees high levels of stress. In its defence Telstra Australia argued that the GPS devices recorded when the staff member was at work, for how long and information on an employee’s driving skills and that the data obtained conform with national privacy principles.\textsuperscript{18}


\textsuperscript{16} S. Canning, Geotags as a great tip-off for burglars, The Australian, 12\textsuperscript{th} July 2010, p.32.

\textsuperscript{17} J. Francica, Will your personal GPS protect you from litigation?, Directions Magazine 3\textsuperscript{rd}, February 2010 and podcast at http://www.directionsmag.com/article.pho?article_id=3397, as of 28 January 2014.

\textsuperscript{18} E. Hannan, Telstra at legal risk over car spy bugs, The Australian, 30\textsuperscript{th} July 2007, p. 3.
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The discussions so far suggest that GPS devices may be used as a helpful navigational aid, a tool for positioning but at the same time as an instrument for data gathering. It has also been suggested that the device be deployed as a shield to assist in litigation and provide evidence in court. GPS units have the unique feature of plotting waypoints to tell the user where they have been but also where they are in real-time. The tracking of speed, time, and location may be recorded for later uploading onto mapping software for graphical display purposes. The GPS device represents a convergence of advanced mapping technology that couples satellite tracking and wireless communications. The Google location-aware friend finding system called Latitude will generate a lot of geospatial information about where millions of people have travelled each day. The potential applications are huge including use as a fitness data logger for joggers charting their progress using satellite technology with the mobile device, traffic flow overlayed with weather data, trip-based auto insurance, trip-based road use charging and navigation kits for the visually impaired.

Geospatial applications are limitless but one needs to wonder whether the legal liability regulations are likewise mirrored. A burning question that may be asked is: At what point will digital geospatial information be so inherently trustworthy and tied to user’s real-life surroundings that the provider of that information should be held responsible in law for failing to anticipate and to react to changing conditions? The current state of play suggests that the user will be solely responsible and is in the best position to use geospatial data supplied interactively to real-world

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19 M. Cocquio, Making tracks, digitally. GPS will tell where you’ve been as well as where you are, The Australian Exec Tech, 31st October 2006, p. 7.
23 See U.K. Norwich Union’s (now known as Aviva) Pay As You Drive option introduced in October 2006 where customers with GPS enabled cars send location data to the insurance company’s computer. The computer then calculates a monthly insurance charge based on distance travelled, time of day, routing and hazards and risks avoided or incurred. However, the innovative insurance scheme was withdrawn in 2010 because it was too costly to operate. See http://www.payasyoudrive.com.au/tools/paydblog/PAYD-Blog/September-2008/Why-Norwich-Union-pressed-pause-and-the-problem-w.aspx, http://www.aviva.co.uk/media-centre/story/2840/norwich-union-launches-innovative-pay-as-you-drive/ and http://newsvote.bbc.co.uk/mpapps/pagetools/print/news.bbc.co.uk/2/hi/programmes/moneybox/7453546.stm, as of 28 January 2014.
conditions. Perhaps, there may be a need to supplement this reality with technology and augmented carefully by law – a prospect that is contemplated next.

4. Dynamic Geospatial Data – GPS and Augmented Reality (AR)

The discussion on GPS technology gave a list of different kinds of ‘navigational troubles’. It suggested that a number of variables could have conspired to produce these problems including destinations, routes, the sensing of a vehicle’s location in geographic space, and the timing of a turn instruction given by the GPS unit. Invariably human error is responsible for many of the problems including giving ambiguous destinations or entering incorrect highway junctions thus forcing the GPS unit to re-calculate locations and routes. There may be no fault with the software in the GPS unit nor is there a map deficiency. One emerging solution to the dynamic problems generated by in-car navigation systems could be the introduction of heads-up displays (HUD) and augmented reality (AR). A heads-up display is any means of presenting data without requiring the user to look away from their usual viewpoints. The origins of HUD are from its use by military aircraft pilots where their heads are positioned looking ‘up’ and forward at navigational information projected onto the front wind-screen instead of having to look down at the instruments console. Today HUD are used in commercial aircraft, vehicles and other applications that offer information on vehicular speed, engine speed, relative geographic location and navigation systems.

GPS, when coupled with the emerging AR technologies could provide untold benefits. AR provides a dynamic live view of a physical real-world environment whose elements are supplemented by computer-generated sensory input such as sound, video, graphics and geospatial information. Through AR, the user’s perception of reality is enhanced in real time rather than a simulated one found in virtual reality (VR) scenarios. The information about the surrounding real-world becomes interactive and can be manipulated digitally by the user since derived information about the environment and its objects can be overlaid on the real-world.

However, the current state of AR technology and its recent introduction to common use may yet be sufficiently mature to provide the solutions sought for navigation purposes. Wassom (2012) has discussed the perils of augmenting reality while driving. Driver distraction either in answering a mobile phone or reading and sending text messages have been recognised by road safety experts and transport researchers as an epidemic and the probable cause of collisions and

other disasters. The Detroit suburb of Troy has prohibited not only texting but also making a phone call and “any other activity that can distract a driver and affect their ability to safely operate the vehicle. Activities under this classification include, but are not limited to, eating, grooming, reading, writing, or any other activity that prevents someone from having control of the vehicle with at least one hand on the wheel.”

Using an AR app on a smartphone whilst driving is similar to a form of texting because while one may not be inputting information into an electronic device, one may have one’s eyes on the displays rather than concentrating on the road. The AR iPhone app, for example, apparently can detect “your lane and other vehicles in front of you and provides useful information for your driving situation” but only “in good lighting conditions during daytime for visible lane markings on highways and country roads and for detection of regular cars.”

AR technology may be still some way off from being commonplace such as an in-car AR navigation system with heads up displays and ‘targeting’ icons. However, the announcement by Japan’s Pioneer electronic manufacturer gives some promise. The Pioneer AR GPS unit claims to be able to calculate exact distance between any given points in order to provide the most accurate information so as not to miss any next turn point, is capable of identifying the lane the vehicle is on, as well as red lights and other traffic signals ahead. However, the Pioneer system still relies on a dash mounted video display which is no more different from present GPS systems. One would still have to take one’s eyes off the road to look at it and as such could be a distraction and could be illegal in some jurisdictions. An MIT article has suggested that eye-tracking AR systems actually produce as many problems as it attempts to solve. Systems that try to make AR less intrusive could in fact throw off one’s sense of how one is moving that could lead to disorienting motion sickness, interfering with peripheral vision together with other distractions that multi-tasking could introduce.

In summary, using AR units as headsets or special eyewear while driving can create potential for distraction no matter how the information is displayed. This poses technological and legal challenges that are as yet close to resolution. While

AR reality units collect data from the surrounding locations and display these to assist drivers, the collection of geospatial data by groups of people for use in mapping products has gathered momentum. The use of geospatial data collected by ‘crowds’ and volunteers pose a different set of legal and policy challenges.

5. Crowd-sourced & Volunteered Geographic Information

Volunteered geographic information (VGI) is “the widespread engagement of large numbers of private citizens, often with little in the way of formal qualifications, in the creation of geographic information”.\(^3\) VGI is part of a broader trend of “user-generated content” that is becoming commonplace in Web 2.0-based applications. The VGI community plays a much more influential role and they have sometimes been called ‘produsers’\(^2\). Web 2.0 environment and other mobile technologies have opened up the landscape for nearly everyone to access the internet to create and share content leading to the democratisation in the production of information. *Ushahidi* (‘witness’ in Kiswahili) is the interactive map that was developed in the wake of the disputed Kenyan elections in 2007. This map provided eyewitness accounts of violence across the country with written text in *Ushahidi* and images displayed as reports on Google Maps. Such an example provides untold potential applications that could assist first responders and humanitarian organisations in the wake of natural disasters, crises and violent conflicts. But, what if the subscribed data were biased and wrong? These issues could raise legal liability questions which courts have yet to grapple with.

For example, a debate has arisen about the quality of the data contributed by the ‘crowd’ relative to those produced by professional mapping agencies. Data authoritativeness is closely linked to the quality of the contributors. Traditional government sources have always been considered more ‘authoritative’ than data produced by volunteers. This might be a moot point but the meaning of authoritative geospatial data has been brought into question. It is suggested that traditional geospatial data producers might not have continuing funding nor the mandate to keep geospatial databases current whereas VGI data might

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trump such producer sources with high accuracy, completeness, timeliness and at a practical usable scale.\textsuperscript{33}

In Canada the Centre for Topographic Information of Natural Resources Canada is assessing the potential of a collaborative mapping model that combines contributions from provincial and municipal organisations with those from citizens.\textsuperscript{34} In Australia the state of Victoria’s Department of Sustainability and Environment has developed the Notification and Editing Service that encourages crowdsourcing while the OpenStreetMap Collaborative Prototype (OSMCP) project of the U.S. Geological Survey (USGS) and swisstopo Revision Service of the Swiss Federal Office of Topography are experimenting with similar ideas. Major barriers include the issues of quality control and monitoring of VGI contributions and who determines whether the contributed data are of the requisite quality. In the U.K. OpenStreetMap (OSM) is one of the best known examples of collecting and leveraging VGI. Initiated in 2004 the project was a response to the strict copyright laws that apply to Ordnance Survey maps and geospatial data. With OSM any interested party could view and edit geographic data in a collaborative way. Registered contributors could make additions, modify inaccurate features, delete stale or invalid data and generally edit features to improve the quality of the geospatial database. In addition to individual contributions, organisations have donated complete data sets to OSM. Ironically OSM does not use quality control experts to vet contributions. The quality of the data is refined over time through iterative corrections of the submitted data by subsequent contributions.\textsuperscript{35}

Apart from tort liability, another legal concern is that of intellectual property rights (IPR) in the contributed data and where copyright might subsist. In most jurisdictions copyright is vested in original work that is the expression of an idea that also involves a degree of skill and judgement in the work. The Australian Copyright Council has suggested several steps to manage and minimise potential liability risks.\textsuperscript{36}


With many contributors adding to the volunteered geospatial data in the database, there might be difficulties in tracing lineage and hence the ownership of the copyright. The ‘confected’ data may lose copyright status other than a ‘generic’ claim to the copyright by the user agency. It may be suggested that the use of Creative Commons licences and copyright regimes could assist in resolving this problem.\textsuperscript{37} A further difficulty is that the confected data may be inaccurate, corrupted with errors and there may be no one to blame because there is no copyright holder to be held accountable.

Traditionally geospatial data produced by government agencies have copyright vested in the Crown even in cases where the agency is the first publisher of VGI contributions. In these instances it is important to communicate the intention of the Crown to contributors and to emphasise the terms and conditions of use. In turn, VGI contributors give permission for use of their data content and this in turn defines the extent of the permitted uses. There could also be a binding agreement with contributors to ensure that they will not infringe the rights of third parties and that they will indemnify site operators for any damages arising from any such infringements. Such an agreement will include a statement that unequivocally states that the contributors themselves have the rights to the contributed data. On the other hand, contributors may request attribution and acknowledgement of their contributions. In most jurisdictions moral rights clauses in the legislation provide for such attribution.

In cases where the VGI contributed data contain material that infringe copyright, diligent efforts to remove such material should be taken to prevent further infringement. Also the use of disclaimers to alert users to the limitations of the data can help mitigate and prevent liability.

Tortious liability may arise in a number of other ways as well. VGI site operators must insist that users accept the terms of use of their data. This should also include any advice about data limitations. However, liability could arise from the unauthorised use of copyrighted data contributed by a third party data supplier. Inappropriate use of personal information by VGI user organisations may contravene privacy and data protection legislation.

VGI data supplier organisations may be liable for negligent contributions of erroneous data that result in injury or damages to persons who have relied on that data. Data accuracy is thus critical for VGI organisations. The extent of the responsibility for user generated content could hinge on the degree of quality control in the data it receives, the editorial and filtering of data contributions, the nature of

\textsuperscript{37} See: http://www.creativecommons.org/licences, as of 28 January 2014. Creative commons licences give everyone from individual creators to large companies and institutions a simple, standardized way to grant copyright permissions to their creative work.
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the contributions made and the degree of control asserted in the data. Under tort law the greater the control the greater is the responsibility and hence exposure to liability should anything go wrong and which is traceable to the data source.

Professional geospatial data producers assume a higher standard of care. They may be sued for providing incorrect data, misleading or negligent information as well as defamatory information. However, it would be difficult to hold amateur contributors to the same standards of care as the collection of their data may not have undergone as rigorous a process as the professionals, may contain minor errors, and may be an amalgam of data from numerous sources.

Another aspect of VGI produced geospatial data is that of exposure to liability of the volunteers. Good Samaritan law is not found on statute books but as a concept that courts have applied as public policy. There are however varying practices in different jurisdictions.

In Australia the various states have enacted Good Samaritan laws that protect professionals providing assistance at the scene of an accident or any emergency. In summary, most of these provisions define a Good Samaritan (rescuer) as a person acting without expectation of payment or other consideration who comes to the aid of a person. Hence, a Good Samaritan should not be liable for assisting in an emergency if s/he was exercising all reasonable care and skill. Laws in much of Europe criminalize failure to help people in peril in emergency situations and indeed in Germany the failure to provide first aid to a person in need is punishable under § 323c of the German Criminal Penal Code.

In the U.S. courts take a very hard line on the rule that there is no duty to rescue. Robson (2011) discusses the so-called ‘Good Samaritan’ laws in the U.S. which do not require a person to rescue another, even if the person could do so safely. Some suggested steps to mitigate the liability include:

1. A volunteer group that undertakes to rescue opens itself to liability.

38 See the English case of Bolam v Friern Hospital Management Committee [1957] 1 WLR 582 and the discussion on the higher standard of care required for professionals practicing in their field of expertise in G. Cho, Geographic Information Science: Mastering..., pp. 370 ff.


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2. A duty to rescue arises when a person puts another in danger and there is then the responsibility to mitigate the harm and danger.

3. A duty to rescue arises when there exists a special relationship between the parties.

Such duties could be mitigated by not undertaking rescue services and in the case of geospatial data by not providing the crowd sourced maps. The digital volunteers could assume the role of a passive observer and not communicate with the victims. Or, the digital volunteers could discourage reliance on the information that are disseminated with the use of disclaimers and other notices with statements to the effect that the information are not to be relied upon in life threatening situations. Worries about legal liability remain in the sense that crowd sourced data might be misused; volunteers could get hurt in collecting the data; the legal responsibility for the data are unascertained and unascertainable; and the legal status of the volunteers themselves as a loose collective of like-minded people who wish to help is uncertain. The U.S. Federal statute *Volunteer Protection Act of 1997 (VPA)* offers some protection to a broader range of digital volunteers such as operating under organisational structures of a certain kind and imposition of limits on volunteer compensation.

The VGI community of contributors in general and crisis mapping community in particular may need to develop general standards that address issues of ethics, privacy, and security. Each of these issues surface where crowd sourced maps are deployed whether in a disaster situation or in the calm surrounds of suburban planning. Laws that bring together technology, the governance of volunteered information and legal protection for all is the looming challenge for policy makers and governments. One view is that if the legal questions are not properly managed, tort liability might have “the potential to destroy the model before it realises its potential”. Given the need for large-scale data and the ubiquity of geospatial data, technology has been developed to make these available anywhere, anytime and anyhow. The advent of cloud computing and its use for geospatial applications promise a lot but with concomitant unresolved legal issues.

6. Cloud Computing (CC) and Geospatial Cloud Computing (GCC)

Computing clouds provide a means to undertake computing tasks, software, data access, data storage resources. Users of cloud computing (CC) take advantage

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44 *E.S. Robson*, Responding…
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of computing infrastructure but are not involved in the detailed technical setup. The advantages offered by CC generally and in particular to geospatial cloud computing (GCC) analysts, users, data providers and others are unlimited. The benefits include lower costs, enlarged access to products and services and being able to do so online from (theoretically) anywhere in the world. Geospatial software needs may be rented or paid for on the basis of use and access data required on a needs basis through web services. This is indeed neo-geography *par excellence* and the ‘cloud’ is poised to radically change the way geospatial analytics is performed. As an example, the U.S. government has introduced its ‘cloud first’ policy for new government computing requirements.\(^45\)

According to the U.S. National Institute of Standards and Technology (NIST) cloud computing is a “model for enabling ubiquitous, convenient, on-demand network access to a shared pool of configurable computing resources (e.g., networks, servers, storage, applications, and services) that can be rapidly provisioned and released with minimal management effort or service provider interaction”.\(^46\)

Four service classes of CC include infrastructure as a service (IaaS), the platform as a service (PaaS), software as a service (SaaS) and data as a service (DaaS). Each of these entities may overlap and may have some shared features. As the names suggest infrastructure services could include computing resources for processing, storage and networking whereas the cloud as a platform provides the environment in which organisations and agencies create and deploy applications in a web-based context. To drive some of the applications the necessary software could be made available for business applications. Data as a service are the necessary component to drive either the infrastructures or the platforms and applications. Geospatial information applications require the ability to mine data, to discover data connections, to access, to manipulate and to use these for dynamic or static mapping purposes. The GCC concept satisfies the needs of geospatial analytics.

Ordnance Survey (OS) GB is the National Mapping Agency in the U.K. and since 2010 has made available geospatial data to the public to encourage innovation and government transparency.\(^47\) OS is by far the largest public sector agency that makes use of CC as part of its web mapping service that deploys geospatial data to customer websites and enterprise systems. The services are hosted on the Amazon Web Services (AWS) platform.\(^48\)

Some of the common issues that may arise from the use of GCC include those of security in terms of unauthorised use of the services and other resources, the protection of personal, confidential and sensitive data, intellectual property rights especially of copyright and licensing the use of geospatial data and aspects of legal liability. Natural Resources Canada’s Primer on Cloud Computing lists ten different security risks identified from a survey of users. Among these risks include abuse and malicious use of CC the result of spammers and hackers, weak application programming interfaces that expose CC users to confidentiality and integrity risks, technological vulnerabilities arising from shared technologies, data leakage, service and traffic hijacking, delegations of authority to the vendors and encryption issues.\textsuperscript{49} While the risk concerns appear to be well founded with reports of data security lapses, helpful advice are available, for instance, from the European Network and Information Security Agency.\textsuperscript{50} In addressing some of these concerns an understanding of the roles and responsibilities of both the vendors and users are as important as assessing the threats and in mitigating the losses. Where these rights and duties have been established the sharing of liability as well as the burden of the liability may be apportioned by mutual consent, arbitrators and mediators.

Closely linked to issues of data integrity and security are ownership issues and consents to the release of the data containing private, confidential and sensitive information. The GCC platform vendor will have implicit access to all the user data that is deposited on its servers. However, there is the danger that the data may be disclosed to third parties innocently, advertently, inadvertently by accident, and deliberately by unauthorised persons. The key to security risks hinge on the contractual relationship between user and vendor and how these are managed. The selection of the contractual issues include the terms of service that is to be provided by the cloud vendor, disclosure of information to third parties and data protection protocols including indemnities and warranties regarding the data in storage, other legal obligations emanating from the privity of contract and contract clauses and updates of operating procedures on the cloud.\textsuperscript{51}


\textsuperscript{51} Readers of this chapter may be interested to note that some of these contractual type issues are discussed at length in the chapter on geospatial information contracts elsewhere in this book.
Chapter IX. Geospatial Information: Emerging Liability Issues

Issues of intellectual property rights especially that of copyright and licensing the use of geospatial information revolve around the duplication and downloading of the data by users and whether they have rights of access to the data as these could be protected under licence. The backup and transfer of copyrighted works stored in the cloud may be controlled through licences. However, in some instances there may be jurisdictional prohibitions imposed on the transfer of data across international borders. The EU Data Protection Directive, for example, regulates the processing of personal data within the European Union.\textsuperscript{52} Important components of this Directive include that of privacy and human rights law.\textsuperscript{53} On 25 January 2012 the European Commission unveiled a draft of the EU General Data Protection Regulation that will supersede the Data Protection Directive that may have direct implications on GCC usage and deployment.\textsuperscript{54}

Aspects of legal liability deal largely with contracts and lease agreements including service levels with GCC service providers. Apart from privacy, confidentiality and data security discussed previously, contractual liabilities would include where and how the data are stored, who has access to the data, the responsibilities not only of data providers but also that of GCC service providers as well as the responsibilities of end users. This is because there may be unauthorised and inappropriate use of the data, claims of data ownership, disclaimers and warranties as to the fitness of purpose of the data for particular applications and indemnities by the vendors. Other aspects of liability hinge around governing law and jurisdictional and transitioning issues especially where the service is provided in one jurisdiction while the user may reside in a different jurisdiction. Transitioning-in and out of the agreement to use particular GCC platforms may produce liabilities that have to be resolved either at the beginning or at the end of engaging a new service provider. Loss arising from cessation of services that fracture business continuity have also to be factored into legal liability risks.

7. Some Preliminary Conclusions

Liability is a harm-based legal concept where one would be held responsible for any injury or loss. With the increasing use of geospatial information the emerging issues of tort liability are varied and are a response to the

\textsuperscript{52} Data Protection Directive 95/46/EC on the Protection of Individuals with Regard to the Processing of Personal Data and on the Free Movement of such Data.


new environment. The Web 2.0 space is changing the traditional landscape of geospatial data collection, distribution and use giving rise to an urgent need to re-evaluate the traditional legal framework. The concept of geo-liability would not be very far off the mark in this discussion. Geography has become ubiquitous, is omnipresent and the geospatial data more ‘dynamic’ in its collection and everyday use.

In such a milieu there is a strong push for a re-evaluation of the legal and policy framework in both the civil law systems and the common law jurisdictions world-wide. Liability arising from the use of paper-based maps and charts has been litigated in the courts in various jurisdictions. Today the use of digital geospatial information may generate civil and criminal law litigation where a defendant is identified and where disclaimers and warranties might be used to both prevent and reduce legal liability risks.

The geospatial information landscape emphasises the ‘G’ in the geography, in the GPS units that are used to navigate as well as the commonly used Google Maps. The quality and accuracy of the geospatial information remain paramount considerations to ensure proper usage and error-free calculations. GPS as electronic aids, however, can have its dangers and pitfalls and entrap the unwary user. Sometimes data from GPS units might be used for evidentiary purposes and at other times as useful input for location-based services. Attempts to use GPS for surveillance purposes on board vehicles have had a mixed reception.

More recently the pairing of augmented reality displays with GPS units has added a ‘dynamic’ element to geospatial information. However, the heads-up displays suffer the same criticism as those sending text messages whilst driving or looking at GPS display units. The legal issues are unresolved because of the ‘newness’ of AR technology in civilian applications. Similarly, with VGI and crowd sourced geospatial information the issues about the accuracy and authoritative-ness of the data are often debated. This is in addition to tort liability and intellectual property issues with VGI data. Traditional geospatial data collected by public agencies have copyright vested automatically in the Crown, but questions arise whether the same may be said that copyright in VGI data are vested in the ‘crowd’? Further one might also ask: who is the crowd?

There seems to be a tacit acceptance of the terms of use of VGI data as well as the consequence of the negligent contributions of erroneous data. Also as there are amateur collectors and contributors of the data there appears to be a lowering of the standards of care. Volunteered and crowd sourced geospatial databases also raises issues with Good Samaritan laws where rescuers are protected from liability. But the laws are mixed for different jurisdictions from the harsh U.S. position to the more benevolent, for example in the Australian states. The challenge here for policy makers is that if there were to be no legal protec-
tion for volunteers, the ensuing litigation may destroy the VGI model before it reaches its full potential.

Cloud computing is the next ‘storage’ media that appeals to the needs of the neogeography par excellence. CC is changing the way geospatial information and geospatial analytics is being conducted. However, the issues of security of information, the protection of personal, confidential and sensitive data, intellectual property and aspects of tort liability still remain in the background.

The Web 2.0 environment has witnessed a new wave of data collection methods, data use and data analytics. How this new world of data is managed can be very challenging. CC, the internet of things, open standards and open source all challenge traditional means of ‘professional’ data creation, collection and storage. With public sector funding of the collection of geospatial data becoming more restricted in challenging economic times, the geospatial industry may have to turn to use shared open data that might be crowd sourced. Protection by way of licencing and new methods of data ownership will have to be developed. In turn standards and new usage policies will also have evolve. Yet, there remains tort liability issues related to questions of data assurance, integrity and ownership.

However, this chapter has shown that the record among different jurisdictions is mixed. For example, newly developed countries like China and India, and developing countries like Indonesia are very ‘security conscious’ and sensitive in so far as geospatial information and data are concerned. The fear of threats of invasion and border incursions persist. Indonesia provides an extreme example where all geospatial data is collected by a central agency and no one else may collect such information. The Indonesian Geospatial Information Act No. 4, 2011 provides the legal framework for acquiring accurate geospatial data and creates a regulatory framework for the administration of national geospatial information. Criminal sanctions are in place to prevent the collection of geospatial data by private persons.

This chapter suggests that radical changes are needed to reduce geoliability. This is because legal liability theories governing geospatial information are largely under-developed and there is a tendency for the law to lag behind technology relative to resolving the growing problems and issues of technology. The disparities between legal and policy frameworks are evident. Technological development in relative terms is without boundaries. Legal and policy frameworks tend to ‘lag’ and are not developed in a consistent manner. Such under-development leads to a degree of uncertainty and perhaps a ‘chilling’ effect on venture capitalists who might refrain from new and innovative investments for ‘fear’ of unknown legal repercussions. On the other hand, addressing the legal and policy challenges head-on may lead to greater developments in geospatial information.
production and use. A legal framework that provides ‘security’ in all ways could also lead to long-term benefits to all concerned. It is suggested that in the final analysis some kind of a ‘relational’ law is required within a renewed framework where technology, networked governance and legal protection of geospatial information is in place.
Chapter X. Geoinformation and Cadastre, Legislation in Switzerland

1. Introduction

In the context of a new regulation of the financial compensation between the Swiss Federation and the Cantons a new article was introduced in the Federal Constitution of April 18, 1998. This change concerning the National Survey was among others approved in the popular vote on November 28, 2004 and put to force by January 1, 2008.

Art. 75a National Land Survey

1 The National Land Survey shall be the responsibility of the Confederation.
2 The Confederation shall issue regulations on official surveying.
3 It may issue regulations on the harmonization of official information relating to the land

Figure 1. New article in the constitution

It was the first time the Land Survey was underpinned with a constitutional base. These aspects were until then regulated by a special federal law, the Federal Act of 21 June 1935 on the Creation of the National Map Series.

For the cadastral surveying, called Official Surveying in Switzerland, the legal foundation was the Ordinance on Official cadastral Surveying of 18th November 1992 based on Article 950 of the Civil Code saying:

Registration and description of the properties in the land register have to be done on the basis of a map, which as a rule, has to be the result of an Official Surveying.

The task to elaborate the new legal framework in this field was assigned to the Federal Office of Topography – swisstopo – the authority concerned with the

---

1 Switzerland had put to force one of the first laws on geoinformation in the world by July 1, 2008. This law is also the legal base for the implementation of the Swiss NSDI. In this context a Cadastre of public-law restrictions shall be built up. For the regulation of this new cadastre the Ordinance on the Cadastre of Public-right Restrictions of Landownership was developed and put to force by October 1, 2009. This paper gives an overview on the development and the content of these new pieces of legislation. In addition the problems occurring during the drafting process, first experience, and the consequences of the new legislation on the profession are outlined.
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geographic reference data, the cartography and the cadastral surveying and the national geological survey.

Swisstopo was a pure Geodetic and Cartographic Office for a long time and its key business was cartography for defense purposes. It still belongs to the Federal Department of Defense, Civil Protection and Sport.

In 1987 the office was transferred from a normal office to a body managed along commercial lines as part of the NPM (New Public Management) pilot project (productivity commitment and global budget).

The Federal Directorate of cadastral Surveying was transferred from the Federal Department of Justice and Police to swisstopo in 1999 and in 2000 COGIS the federal coordination unit responsible for the coordination of geoinformation on federal level was built up.

In 2005 the National Geological Survey authority was subordinated to swisstopo and its legal base was included into the legislation.

So swisstopo has a rather strong position in the field of geoinformation.

Figure 2. Organization of the Swiss State Survey System
Chapter X. Geoinformation and Cadastre, Legislation in Switzerland

The organization and the structure of swisstopo is shown in figure 3.

![Organizational Structure of swisstopo](image)

**Figure 3.** Organizational Structure of swisstopo

2. Starting Condition

After 1980 a fundamental revision of the Swiss legislation on the cadastre took place. A new approach taking into account the application of modern IT for the cadastral surveying was the guideline for the reform of the Swiss Cadastral surveying.

The result of this re-engineering work was a new standard for cadastral surveying, called AV93 (Official Surveying 1993), because the new regulations entered into effect in 1993. The characteristics of this new standard is as follows:

**Elements of AV93**

- Information content was not changed compared with traditional cadastral surveying
- Definition of a data model with 8 information layers
- Data description with standardized data description language INTERLIS
- Possibility for the setting up of general land information systems LIS

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The key achievements of the reform are represented by figures 4 to 6.

**Figure 4.** The information layers of AV93

**Figure 5.** INTERLIS for representation of reality and data transfer without information loss
<table>
<thead>
<tr>
<th>Information topic</th>
<th>Data owner</th>
<th>Data acquisition</th>
<th>Data maintenance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Other topics</td>
<td></td>
<td>other</td>
<td></td>
</tr>
<tr>
<td>Land use planning</td>
<td></td>
<td>planning zones</td>
<td>Canton, Communities</td>
</tr>
<tr>
<td>Forestry</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cable TV</td>
<td></td>
<td>facilities</td>
<td>Private firms</td>
</tr>
<tr>
<td>Electric power supply</td>
<td></td>
<td>facilities</td>
<td>Power company</td>
</tr>
<tr>
<td>Civil protection</td>
<td></td>
<td>protection zones</td>
<td>Communities</td>
</tr>
<tr>
<td>Fresh water</td>
<td></td>
<td>facilities</td>
<td>Corporations, Communities, ...</td>
</tr>
<tr>
<td>Waste water</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Railways Telecom</td>
<td>rails facilities</td>
<td>Railways Telecom</td>
<td>Railways Telecom</td>
</tr>
<tr>
<td>AV93</td>
<td>basic data</td>
<td>Canton</td>
<td>Canton (licensed surveyors)</td>
</tr>
</tbody>
</table>

**Figure 6. Ideas to build LIS**

When the law on geoinformation was to be elaborated swisstopo disposed already of experience in the drafting and implementation of a legal framework in the field of geoinformation. Swisstopo was able to base on lessons learned since 1993 when AV93 became effective.

Swisstopo engaged a lawyer as drafting specialist and formed a working group for the elaboration of the geoinformation law. This group including representatives of the cantons and the interested organizations consisted of persons with experience in geoinformation from different stakeholders concerned with geodata and working with GIS/LIS. In parallel different taskforces were working on the ordinances as soon as the first draft of the law was available.
3. Time frame

The work on the new Law on Geoinformation started in 2003, after the Federal Council of Ministers had approved the geoinformation strategy developed by swisstopo’s COGIS body. At the same time the strategy for a new financial compensation scheme was adopted by the Swiss parliament, which created the need to accelerate the legislation process. Figure 7 shows the timeframe for the elaboration of the law package.

**Figure 7.** Time frame for the law development work

4. Result of the Work

4.1 Structure of the Law

The result of the work is first the Federal Act on Geoinformation with 47 articles on 14 pages. Figure 8 shows its structure.

**Figure 8.** Structure of the Act on Geoinformation

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4.2 Effectiveness

The general provisions have direct impacts on the special parts, regulating the tasks National Land Survey and Cadastre Survey given by constitution as well as the National Geological Survey and the Cadastre of the public-right restrictions of the landownership. At the same time it impacts all special laws, which deal in one or another way with space related arrangements, be it plans, maps, description of boundaries and places – in short geoinformation.

4.3 Ordinances

In addition 11 ordinances were on the topics shown in figure 9 were drafted and 9 of them entered in effect together with the Act. The Ordinance on the Cadastre of Public-right Restrictions of Landownership was put into force on October 1st, 2009 and the Ordnance on the Fees for Geoinformation on January 1st, 2010.

<table>
<thead>
<tr>
<th>Ordinance on the Geoinformation (GeoIV)</th>
<th>Ordinance on the Cadastral Surveying (VAV)</th>
</tr>
</thead>
<tbody>
<tr>
<td>54 articles + catalogue of official geodata</td>
<td>Technical Ordinance on the Cadastral Surveying (TVAV)</td>
</tr>
<tr>
<td>Technical Ordinance on the Geoinformation (TGeoIV)</td>
<td>Technical Ordinance on the Cadastral Surveying (TVAV)</td>
</tr>
<tr>
<td>Ordinance on the National Land Survey (LVV)</td>
<td>Ordinance on the Education and the Professionalism of Licensed Surveyors (GeomV)</td>
</tr>
<tr>
<td>Technical Ordinance on the National Land Survey (TLVV)</td>
<td>Ordinance on the Public-Law Restrictions of Landownership (PLR)</td>
</tr>
<tr>
<td>Ordinance on the topographical names (GeoNV)</td>
<td>Ordinance on the Fees for Geoinformation (GebV)</td>
</tr>
<tr>
<td>Ordinance on the National Geology (LGeoIV)</td>
<td></td>
</tr>
</tbody>
</table>

**Figure 9.** Ordinances connected with the Act on Geoinformation

The Ordinance on the Geoinformation regulates the details concerning geodata. In the annex all the official geodata identified in the different special laws of the federal legislation are listed in the Official Data Catalogue, which contains 175 data sets, describing spatial objects.

Figure 10 shows an extract of this catalogue as an example.
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<table>
<thead>
<tr>
<th>Nr.</th>
<th>Description</th>
<th>Legal base</th>
<th>Responsible</th>
<th>Georeference</th>
<th>PRL Cad</th>
<th>Access right</th>
<th>Online access</th>
</tr>
</thead>
<tbody>
<tr>
<td>95</td>
<td>Groundwater protection zone</td>
<td>SR 814.20, §20 cantons</td>
<td>yes</td>
<td>yes</td>
<td>A</td>
<td>yes</td>
<td>yes</td>
</tr>
<tr>
<td>96</td>
<td>Groundwater protection area</td>
<td>SR 814.20, §21 cantons</td>
<td>yes</td>
<td>yes</td>
<td>A</td>
<td>yes</td>
<td>yes</td>
</tr>
<tr>
<td>97</td>
<td>Groundwater source</td>
<td>SR 814.201, 30 cantons</td>
<td>yes</td>
<td>yes</td>
<td>A</td>
<td>yes</td>
<td>yes</td>
</tr>
<tr>
<td>98</td>
<td>Inventory of groundwater sources</td>
<td>SR 814.20, §82 cantons</td>
<td>yes</td>
<td>yes</td>
<td>A</td>
<td>yes</td>
<td>yes</td>
</tr>
<tr>
<td>99</td>
<td>Inventory of water rights</td>
<td>SR 721.80, § 31 BAFU</td>
<td>no</td>
<td>no</td>
<td>B</td>
<td>no</td>
<td></td>
</tr>
<tr>
<td>100</td>
<td>Regional sewerage plan</td>
<td>SR 814.20, § 7 cantons</td>
<td>yes</td>
<td>yes</td>
<td>A</td>
<td>yes</td>
<td></td>
</tr>
<tr>
<td>101</td>
<td>Municipal sewerage plan</td>
<td>SR 814.20, § cantons</td>
<td>yes</td>
<td>yes</td>
<td>A</td>
<td>yes</td>
<td></td>
</tr>
</tbody>
</table>

Figure 10. Extract from the official geodata catalogue

5. Content of the Act on Geoinformation

Figure 11 presents the List of chapters and sections of the Act on Geoinformation. The highlights of the different regulations are

- The aim is it to make available the geodata on the whole territory of Switzerland easily to every interested person or institution at reasonable cost;
- The law covers all official geodata under federal legislation;
- The technical requirements include data and representation models for geodata and metadata;
- The responsibility for geodata is with the authority which according to the law has to collect, update and manage the respective data and which is to make the data available in every moment;
- The geodata are public unless public or private interests are violated;
- The cadastre of the restriction on landowner rights is introduced and shall be operated by the cantons;
- The legal base has priority on every other regulation concerning geoinformation.
6. Cadastre of the Public-Law Restrictions on Landownership (PLR-Cadastre)

A really new instrument introduced by the Act on Geoinformation is the Cadastre of public-law restrictions on landownership (PLR-Cadastre). The base for the decision for such cadastre was the FIG publication ‘Cadastre 2014’ – A Vision for a Future Cadastral System.²

Land experts concerned with physical planning had expressed already in the years 1970 – 1980 the need for reliable information on facts restricting the landownership rights. In their request for a better documentation of restrictions on landownership they wrote:

_The most important information of the planning and housing legislation worthy to be published are the restrictions of the landownership rights by public law. Those restrictions have their base in a confusing amount of laws and regulations_

of the federation, the cantons and the municipalities and public bodies of different domains of the public law.

After different initiatives on all political levels, the Law on Geoinformation brings now a solution of this problem creating legal insecurity for all stakeholders in the field of territorial work.

The base for this new cadastre is laid in the Act on Geoinformation Art. 16 and the wording is shown in figure 12.

Art.16 Subject matter and form

1 The Cadastre of public-law restrictions; shall contain public-law restrictions on landownership rights which, in accordance with the provisions of the Civil Code, are not part of the Land Register.

2 The Federal Council determines which official geodata under federal legislation are entered in the Cadastre of public-law restrictions.

3 The cantons may define additional official geodata of proprietary nature that must be recorded in the Cadastre of public-law restrictions.

4 The Cadastre of public-law restrictions shall be made available in electronic form either online or by any other method.

5 The Federal Council shall determine the minimum requirements with regard to the organisation, management, data harmonisation methods and processes for the Cadastre of public-law restrictions.

Figure 12. Legal base for the PLR-Cadastre

Restrictions can be documented either by the Land Register in case when they are individual decisions of an authority or by the PLR Cadastre when the decisions have a general character as boundary definitions by laws and official regulations. This provision corresponds to the ideas of ‘Cadastre 2014’ as shown in figure 13. The PLR Cadastre contains only space related objects and only those determined by the federation and the cantons. This is not totally conforming to ‘Cadastre 2014’ stating to include all restrictions of landownership into this cadastre.

It is self-evident that this form of cadastre is possible only with the help of IT.

The provision that the Federal Council determines minimal requirements is a principle of the Swiss legislation, which has to respect the sovereignty of the cantons. The cantons will have the operational responsibility for the PLR Cadastre.
Chapter X. Geoinformation and Cadastre, Legislation in Switzerland

**Cadastre 2014 documenting “Private Law“ and “Public Law“**

<table>
<thead>
<tr>
<th>Traditional Cadastre based on “Private Law“</th>
<th>Impacts from “Public Law“</th>
</tr>
</thead>
<tbody>
<tr>
<td>Boundary definition by agreement</td>
<td>Boundary definition by political decisions</td>
</tr>
<tr>
<td>Process of boundary verification</td>
<td>Process of boundary verification</td>
</tr>
<tr>
<td>Process of title verification</td>
<td>Process of title verification</td>
</tr>
<tr>
<td>Registration</td>
<td>Registration</td>
</tr>
<tr>
<td>100-120% Legal Security</td>
<td>100% Legal Security</td>
</tr>
</tbody>
</table>

**Figure 13. Idea of Cadastre 2014**

The ordinance contains the sections represented in figure 14.

**Section 1: General provisions**

**Section 2: Content and Information**

**Section 3: Inclusion into the Cadastre**

**Section 4: Forms of Access**

**Section 5: Authentification**

**Section 6: Function as official gazette**

**Section 7: Organization**

**Section 8: Financing**

**Section 9: Participation**

**Section 10: Final Provisions**

**Figure 14 Content of the Ordinance on the Cadastre on public-right restriction of landownership**

The most important provisions of this ordinance are:

- The responsibility for the determination of the restrictions remains with the authorities charged with the execution of legal prescriptions. These fix the boundaries where the restrictions are effective. The cadastre has to include these arrangements;
- The boundaries are to be fixed on the basis of the property cadastre data;
- Every interested person will get an extract from the cadastre concerning one or several land parcels;

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– The person getting an extract can ask for an authentication of the content of the extract by the cadastre manager;
– The cantons can declare the cadastre to be the official gazette on respective decisions;
– The cantons are responsible for the management of the cadastre while the federation keeps the strategy and the supervision;
– The implementation of the cadastre is co-funded by the federation and the cantons, the cost of maintenance is to be borne by the bodies which cause the changes in the cadastre;
– The implementation of the cadastre is taking place in two steps. First some pilot cantons will develop their regulations until 2014 and start operation by January 1st, 2015. All other cantons are to be ready to operate the cadastre from beginning of the year 2020.

7. Experience with the Implementation

7.1 Subsequent legislation by the cantons and the Principality of Liechtenstein

Since the Law on Geoinformation came into force on October 5, 2007, most of the cantons have elaborated their own laws concerning geoinformation. These cantonal laws are subsidiary to the federal law and they assign the responsibility for the geoinformation to the offices taking also care of the cadastral surveying. Often the names of the offices were changed and the term geoinformation became a part of the name. The neighboring Principality of Liechtenstein as well developed a Law on Geoinformation based on the Swiss law. However the Principality has to take into consideration the provisions of the INSPIRE Directive of the EU, because it is a member of the European Economic Area (EEA). Switzerland’s law does not directly reflect INSPIRE provisions because Switzerland is neither an EU nor an EEA member.

7.2 Law on the Geoinformation and INSPIRE

However Switzerland has to respect the INSPIRE rules due to other memberships and treaties.

The main difference between the Swiss law and the EU INSPIRE Directive is that the Swiss approach has a focus on geoinformation in general while INSPIRE has an emphasis on the data sets concerning the description of environmental facts and phenomena.

Until now the INSPIRE requirements can be met by the existing law.

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7.3. NSDI

One of the main goals of the Law is the implementation of an NSDI in Switzerland as stipulated in Art. 1:

This Act has the aim of ensuring that geodata relating to the territory of the Swiss Confederation is made available for general use to the authorities of the Confederation, the cantons and communes, the private sector, the public and to academic and scientific institutions in a sustainable, up-to-date, rapid and easy manner, in the required quality and at a reasonable cost.

Like in other countries the implementation of an NSDI is not an easy task. Many different stakeholders must find together, understand each other and be willing to coordinate. Thanks to the general approach of the Law covering all existing laws dealing with geodata as shown in Figure 8, all stakeholders can be addressed and involved in the implementation work.

The provision in Art. 8 The legislation shall identify the authorities responsible for the collection, updating and management of the relevant official geodata. In the absence of specific regulations, this responsibility is that of the specialist authority at federal or cantonal level responsible for the specialist field to which this official geodata relates assigns the responsibilities clearly and corresponds to the principles stated in the FIG publication No 58 on the Spatially Enabled Society (SES).³

8. Lessons learned

The elaboration of this law package was a challenging task. It was not easy to get all the involved bodies and their ideas together and to achieve a comprehensive and coherent solution. The following problems and their solutions are to be mentioned as lessons learned:

- The whole topic was new to the involved bodies and it needed a lot of discussions to achieve a common view;
- Most of the involved persons were involved in the implementation of GIS Systems in different fields and they did do that in an unregulated way. To be forced to follow rules was not liked very much. The reserves created disputes;
- The prescription to model all the data in a formal and strict manner still creates big problems. It seems that GIS people in contrary to the cadastral survey

³ D. Steudler, A. Rajabifard, Spatially Enabled Society, joint publication of FIG-Task Force on Spatially Enabled Society in cooperation with GSDI Association and with the support of Working Group 3 of the PCGIAP. FIG Report No. 58, 2012.
officers which have positive experience with data modeling do not like the binding force of the arrangements;
- The cadastre on the public law restrictions created a lot of resistance. Everybody feared the binding force and were anxious that surveyors would take over their work. This was finally the reason for the determination of a subset of official geodata to be content of the PLR Cadastre by federation and cantons and a step wise implementation of the cadastre.
- The persons working on the data catalogue found the only reasonable way to define the official geodata is a systematic scan of the laws to find spatial related arrangements. This corresponds exactly to the recommendations of ‘Cadastre 2014’ and all of these legal arrangements have the characteristic of restrictions of landownership rights;
- It is a big chance to have a law on geoinformation as a guideline for the implementation of an NSDI. But it will take still some time to get the NSDI working correctly and to have the complete information available.
Chapter XI. GI and Law: Dutch Perspective

1. Introduction

The use of geo-information in practical cases, generally means that you cannot focus on just one legal aspect, but that you need to take all or several legal aspects into account. In this chapter we discuss the impact of legal aspects on the use of geo-information based on several practical cases in The Netherlands.

Basically our starting point is to evaluate the impact of legal arrangements on the use of Geo-information. Legal arrangements can either imply a limitation or an encouragement of the use of geo-information.\(^1\) With use of a conceptual framework we analyze and discuss the impact of the legal arrangements on the use of geo-information within the Dutch context.

Two aspects are dominant in respect to spatial data. One aspect is Intellectual Property Rights (IPR), whereas the other is the liability issue whenever data is used in practice. The government is now in the process of opening up all governmental data, by waiving legal rights in order to be beneficial for all citizens. This must be explicitly proclaimed by setting proper licenses to avoid that existing more powerful acts prevail. They can limit opening up data sets. Examples are acts regarding privacy, safety, copyright and/or data base rights.

In this chapter we describe the current situation of law relating to spatial data in the Netherlands. In the second paragraph we introduce a conceptual framework describing the use of geo-information, whereas this conceptual framework is used to discuss the impact of legal arrangements on the use of geo-information. The third paragraph focuses on several case studies in which the impact of legal arrangements on the use of geo-information is shown. Paragraph four analyses the impact of legal arrangements on the use of geo-information for the selected cases and in the concluding paragraph we discuss the analysis and draw conclusions.


J.D. Bulens, M.H.G.I. Danes, L.A.E. Vullings
2. The Dutch context

In order to describe the Dutch perspective on the relationship between geoinformation and law, an overview of the Dutch context is necessary. This chapter provides this information starting with the national law on public administration. Furthermore, it focuses on the open data strategy, open standards, licensing, scheme, base registers, and domain models.

2.1. National law on ‘Freedom of Information’

The government collects large amounts of data to carry out public tasks. The national law on public administration (Wet Openbaarheid van Bestuur), comparable to the UK ‘Freedom of Information Act’) arranges that information and data needed for public tasks should be available to the public. Article 110 of the Dutch Constitution states: „In the exercise of their duties government bodies shall observe the principle of transparency in accordance with the rules to be prescribed by Act of Parliament.”

The Dutch act on public access for government information came into force in 1980 and has been updated several times. Under the act, any person can demand information related to an administrative matter if it is contained in documents held by public authorities or by companies carrying out work for a public authority. A request can either be written or oral. The act also obliges the government to provide information unsolicited as it is in the interest of good and democratic governance.²

2.2. Open data strategy and policy

In the Netherlands, the government positively advocates an open data strategy in order to reuse its information, and to improve efficiency and effectiveness. This is in line with the most important EU directives currently in force:

– The EU directive on Re-use of Public Sector Information (PSI)³, updated and approved by the EU-parliament in June 2013;
– The 1998 Aarhus Convention on access to information, public participation in decision making and access to justice in environmental matters;
– The directive on establishing an Infrastructure for Spatial Information in the European Community (INSPIRE) contributed in this process.

³ Directive 2003/98/EC.
Chapter XI. GI and Law: Dutch Perspective

The use of open data and open standards are preferred over ‘none-open options’, but it is possible to deviate from open-options whenever implementation could lead to insurmountable issues. In those cases decisions should follow the ‘Comply or explain’ rule which is mandatory.

For open data the main objective is to become more transparent and to ease the digital exchange of information with the public.\(^4\) According to the Dutch government open data can be anything from citizen questions following by governmental answers, official governmental news bulletins to formal travel advices and more. The term ‘open’ means the ability to have access to data/information, but preconditions may exist to actually use the data, which even may include fees. According to the Dutch government, information can only be referred to as open data, whenever it meets the following criteria;
- Is collected within the context of a public task;
- Is financed with public means to carry out a public task;
- The information is public according to the Dutch ‘Freedom of Information’ Act;
- Preferably compliant to open standards (not to obstruct IT-users and providers);
- Is machine readable, to assure that applications can make use of it.

Currently the open data strategy is a process in development, this means that not all governmental data is immediately open. In order to improve access, the government formulated a number of measures:
- Encouraging governmental organizations to provide their information through the national open data portal, according to the open principles. In case they deviate, governmental organizations are obliged to justify and document their decisions (comply or explain);
- A platform to expose applications using open data as a starting point for industry;
- To construct an Open Data Knowledge center in 2012, connecting entrepreneurs to governmental data;
- Initialize a National App Award, with the objective to inspire people to come up with smart and creative applications of governmental data.

Based on these measures the government launched the data portal “data.overheid.nl” at the end of 2009, as a central place for disclosing all open governmental information. Other major results achieved so far, are;\(^5\)


Nine large commercial software developers, including Atos-Origin and Pink-Roccade, signed at the beginning of 2010 the purveyor agreement, in which they commit themselves to support and anticipate on open standards; Since the beginning of 2009, all ministries adopted the open standard Open Document formats (ODF), for reading, structuring, exchange, publication and receiving written documents; All ministries developed individual procedures for tendering, purchasing and utilization of open source software; At the end of 2009 already more than 200 different open source software packages where in use by the government.

In order to accelerate the open data strategy and its re-use, the aim is to expand the number of governmental datasets registered on the national open data portal (www.data.overheid.nl). At the same time more support is needed to facilitate the registration of datasets and to respond to the public open data demand.

2.3. Open Standards

The Dutch policy objective is to implement open standards as much as possible, and set up a single list of standards for different data types. Besides harmonizing technical data exchange, open standards reduce the dependency on vendors of specific software packages and stimulate the use of open source software.

At national level a scheme for base registers is created to be used as a single entry for all public bodies using that base data set. Currently 13 base registers are present and several more will be implemented in the near future. The base registers vary from the base register for persons, chamber of commerce, addresses and buildings, topography, soil and subsoil and so on. For public bodies the use is mandatory, but also private use is allowed following specific rules. This is all legally founded including the duty to report any errors in these registers. It is also described by law who is the registrar, who maintains the registry and who is the source (‘owner’ of the data). It means there are clear responsibilities and information should meet certain quality standards. All terms used in the registers are included in a so-called scheme catalogue (for the spatial domain this is the same as a feature catalogue). By law the use of the terms is prescribed with reference to this catalogue. The catalogue is creating transparency using a common vocabulary and thereby forming a bridge between the legal and the information domain.

2.4. Geo-standards

In 2006 the ministry of Spatial Planning established a separate foundation called “Geonovum” to pursue the ambition of National geo-information infra-
structure. For Geonovum the objectives are; a) developing and maintaining geo-
standards, b) supporting a helpdesk for disclosing geo-information, c) developing
knowledge and d) advising about technological and implementing aspects.⁶

Geonovum developed a scheme for information and domain models specifi-
cally for spatial data for about 14 different domains and is still expanding. This
is more or less comparable with setting up data specifications for the themes in
the three annexes of INSPIRE.⁷ The domain models are all based on a norma-
tive standard for geo-spatial information, a norm referred to as NEN3610 in the
scheme for information models.

2.5. Licensing

As said in the beginning of this chapter proper licensing is crucial to set
clear rights. Worldwide the well-known licensing system of creative commons is
used for “creative works”. On their website⁸ they state: ‘The Creative Commons
copyright licenses and tools forge a balance inside the traditional “all rights re-
served” setting that copyright law creates. Our tools give everyone from indi-
vidual creators to large companies and institutions a simple, standardized way to
grant copyright permissions to their creative work. The combination of our tools
and our users is a vast and growing digital commons, a pool of content that can
be copied, distributed, edited, remixed, and built upon, all within the boundaries
of copyright law’.

In the spatial domain Geonovum conducted a study to investigate the useful-
ness for spatial information and they came up with some additions specifically
based on current practice. This extension is called Geo-Shared.⁹

The conclusion is that the Public Domain Mark or Creative Commons Zero
(CC0) license is preferred for all Dutch Government Open Data. In case this is in-
sufficient Geo Shared is used, allowing a data provider to use more custom defined
user terms if necessary. The three licenses are briefly explained below according
to their websites.

2.5.1. Public Domain Mark

Public Domain Mark enables works that are no longer restricted by copyright
to be marked as such in a standard and simple way, making them easily discover-
able and available to others.

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of%20leg%20uit&status[]=Opgenomen&pagetitle=pasoeof, as of 28 January 2014.
⁸ See http://creativecommons.org/licenses/?lang=en, as of 28 January 2014.
2.5.2. Creative Commons Zero

CC0 enables scientists, educators, artists and other creators and owners of copyright or database protected content to waive those interests in their works and thereby place them as completely as possible in the public domain, so that others may freely build upon, enhance and reuse the works for any purposes without restriction under copyright or database law.

In contrast to CC’s licenses that allow copyright holders to choose from a range of permissions while retaining their copyright, CC0 empowers yet another choice altogether – the choice to opt out of copyright and database protection, and the exclusive rights automatically granted to creators – the “no rights reserved” alternative to our licenses.

2.5.3. Geo Shared (Geo Gedeeld)

The Geo Shared is a set of licenses to customize unique users terms, providing both a legal document as an accessible and a descriptive text. It is possible to include aspects like, attribution, time limitation, fee requirement, purpose limitation, distribution restrictions, derivative work limitation or any additional terms (see also Figure 1).10

Figure 1. User terms categories (ref 13); a) Attribution, b) Time limit, c) Fee required, d) Use with purpose limitation, e) Redistribution prohibited, f) Derivative work limitation, g) Additional terms

3. Conceptual framework

To discuss the Dutch perspective on the relationship between the use of geo-information and law we adapted an existing conceptual framework, originally developed by Vonk (2006) for evaluating the success of decision support systems in policy based on formal and informal aspects. This framework is partially based on earlier work in papers.11 Next we combined the framework with findings of Geo-

giadou & Stoter,\textsuperscript{12} who developed a conceptual framework to study the use of geo-information in governance. It considers the use of geo-information to be related to the four factors (Dissemination, Acceptance, Transparency and Quality Assurance) and is used as the central concept. Despite the framework mainly evaluates the use of geo-information based on cultural aspects, we assume the impact of law will interfere on these cultural aspects, so we used it to study the impact of law on the use of geo-information. The resulting framework is schematically depicted in Figure 2.

\textbf{Figure 2.} Conceptual framework for evaluating use of geo-information (adapted from Vonk; 2006)\textsuperscript{13}

The terms in Figure 2 will be briefly explained below:

– \textit{Familiarity} with the use of geo-information in processes or with aspects of a geo-information project is a first requirement for starting to use geo-applications

– \textit{Quality assurance} can be explained by consistency between the quality of the data related to the used system (hardware and software) and the required quality for the intended use. This relates not only to quality itself but also to trust in the authorities supplying the data. It also relates to common disclaim-


The purposes used to waive liability beyond the quality assurance attached to the data or information at the moment of delivery.

- **Transparency** in the data transformation or more specific the information generating process. All steps needed to convert the available data to geo-information need to be clearly documented. Users should be able to track down all data sources, analysis methods, and assumptions that underlie the geo-information product. Trust in the outcome of a system is founded on the knowledge of the user on the data conversion.

- **Acceptance** of geo-applications depends on the advantages for the user. A requirement is acquaintance with the spatial functionality it offers.

- **Dissemination** means the ability to share all the actions carried out in the decision making process. It is supported by the availability of a geo-information infrastructure and easy access for policy officials to use this geo-information infrastructure.

- **Usage** of geo-information is only effective if conditions are sufficiently met for dissemination, transparency, acceptance and quality assurance.

- **Experience** arises from use. Positive experience contributes to familiarity.

- **Storytelling**, i.e., the ability to successfully disseminate complex material like geo-information in relatively simple wording to a broad audience and hereby position the geo-information within a broader context, can overrule the factors Quality assurance, Transparency, Acceptance and Dissemination and favors usage of geo-information in the decision making process and embed it in daily practice in a natural way.

Legal issues in relation to the broader context of assessment of Spatial Data Infrastructures (SDI) have been touched in a number of papers, but remains an relationship that is not thoroughly studied. In this chapter we focus on legal aspects and use a distinction of three relationships between the use of geo-information and legal aspects (Janssen, 2008).

- Law can operate as a driver for the use of geo-information;

- Law can be a limitation to the use of geo-information;

- The use of geo-information is not affected (positively or negatively) by a law.

In relation to the evaluation framework, legal aspects can either accelerate the process (law as a driver) or frustrate (law as a limitation) the factors Quality assurance, Transparency, Acceptance and Dissemination. We will explore how
this works and whether the conceptual framework helps to describe the impact of law on the use of geo-information by researching a number of Dutch cases in Geo-Information-practice.

4. Case studies

4.1. Case 1: Geo-portal Spatial planning

The national portal Spatial Planning makes spatial plans digital available via public web services.\(^\text{15}\) This portal serves the entire country at all tiers of government – State, Province and Municipality.\(^\text{16}\) The Ministry of Housing and Spatial Planning (Infrastructure and Environment IenM) is responsible for the portal with as main purpose to provide spatial plans to citizens, private organisations and governments in a transparent and comparable way. The site presents the complete and most recent situation at any location inside the Netherlands, in a reliable and clear way. Consequently, citizens and professionals will be able to integrally compare and query spatial plans.\(^\text{17}\) The portal is a consequence of the new law on Spatial Planning active since 1st of July 2008.\(^\text{18}\) The Dutch spatial planning legal act of 2008 aims at improving efficiency and effectiveness in the development, evaluation and monitoring of spatial planning policy.\(^\text{19}\) It enforces municipalities to make their plans digitally available at the source by the 1st of January 2010 for consultation by the public and/or governmental bodies at various stages throughout a spatial planning process.\(^\text{20}\) In 2003 the preparation and implementation of the part of the act that enforces the municipalities to make their plans digitally available started. The deadline for this part of the act was delayed a few times because the infrastructure to share the digital plans was not readily available. The changeover to digital spatial plans meant a complete change of the working process for the municipalities. Plans have to be object-oriented, so just scanning a plan that was made the traditional way was not sufficient. Further more an information model has to be used for standardization purposes to ensure interoperability of spatial plans. The changeover required capacity building, investing in expertise in Geo-Information Systems (GIS), and the creation of a digital planning process.

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\(^{15}\) Cf. www.ruimtelijkeplannen.nl, as of 28 January 2014.
\(^{16}\) Y. Georgiadou, J. Stoter, Studying...
\(^{17}\) VROM, p. 1
\(^{18}\) VROM, 2007b.
\(^{19}\) Ministry of VROM, 2006a.
\(^{20}\) Ministry of VROM, 2010.
4.2. Case 2: Geo-information from agricultural enterprises (farms)

In 1997 a swine fever outbreak among pigs and was the immediate cause to produce a geo-database with spatial information on farms. During the outbreak the lack of accessible spatial information on cattle farms appeared to be an issue. The geo-database is based on two datasets: Agricultural Census and Animal Census. Every year farmers are obliged to register their animals and land parcels for the Agricultural Census and Animal Census. Since then part of the data is used for generating a geo-database that provides easy access to the appropriate data. The geo-database is used ever since during other outbreaks of contagious animal diseases, and is parallel used for regional analyses of agriculture and environmental research regarding agricultural issues. However the geo-database is not freely accessible/applicable as it contains information on farm level and therefore interferes with the law on privacy. The use of the data is allowed for certain purposes only and if so can only be published in aggregated form. These limitations also have to be considered when researchers want to use the database in research questions for the Ministry.

4.3. Case 3: The National Road Dataset (NWB)

In May 2007 the executive body of the Dutch Ministry of Infrastructure and the Environment announced that the National Road dataset (NWB) would be published for use free of charge. The data set contains the road network in the Netherlands (in a digital form) maintained by public bodies and the Dutch Water boards on national, regional and local level. Two market parties objected. One being TNT post/Cendris, legal owner of the Dutch Postal Code Data set which is used within the NWB and licensed to the government for internal use only and basically violating the act on legal protection on databases. The second being Falkplan-Andes, a private company producing roadmaps and selling a comparable and even better product then the NWB to consumers. They claimed competition counterfeiting and loss of income.

In May 2008 the Minister commented that the postal code dataset was only used in the production of NWB and none of the original input data could be retrieved from the NWB. He added that no search facilities on postal codes or addresses would be included. The objection of TNT-post/Cendris was legally declared ungrounded.

Falkplan-Andes objected on different grounds:
1. No legal framework in place for market activities performed by governmental organisations. Collection and dissemination of the road network database was regarded as a market activity.
2. The Government should have investigated if private companies could take care of building up the specific data base, in other words leave the business to the market.

3. An expected future decrease of income, despite the superiority of their product. A free product is much more attractive and easier to use. They added that also societal damage would occur since a less superior data set is used in cases leading to poorer results. They also blamed the government for not having consulted relevant market companies like Falkplan-Andes before making the decision.

In May 2008 the minister responded to the first objection that the re-use of NWB was postponed until the legal framework comes into force. In response to the second objection the minister responded on the fact that having governmental data as such was not an issue to object to. Additionally outsourcing data collection to a single company can potential lead to dependencies causing undesirable situations. Furthermore the data set of the ministry is linked directly to operational systems used for road maintenance and is compliant to systems and formats in use with the government. In relation to the third objection no clear figures of financial loss were found. And an independent research concluded that not a clear outcome could be given for the financial impact releasing the NWB for free and more research was needed. Based on this the decision to release the NWB was postponed.

On 19 January 2010 the Dutch Ministry changed this decision and stated that if new requests based on the ‘Freedom of Information Act’ to open up the NWB were to be received, data would be reviewed again including the impact for industry, especially Falkplan-Andes. The requests came and the Ministry announced on the 5th of July 2011 to decide positively to open up the NWB for reuse.

On 30 November 2011 Falkplan-Andes went to court with a summary procedure and asked for a preliminary injunction to prevent the release.

According to the court there were insufficient grounds to prevent the release. Falkplan posed only in general terms that the company would be seriously harmed by allowing re-use of the NWB. Falkplan also failed to show that allowing the re-use immediately leads to irreversible consequences for the company. Additionally the court added that the Minister obtained the information in the NWB in order to carry out his public duty and that the minister was authorized to allow the re-use of the data. It concluded that re-use is not violating the ‘Freedom of Information Act’ or any other regulation.

In total the legal fight took about 4 years, from 2007 till 2011. In this case public interests prevailed.
4.4. Implementing INSPIRE for protected sites

Several ministries are partners in a national initiative to offer public data as map services (PDOK: https://www.pdok.nl/en/node). This initiative involves setting up a national spatial platform that partners can use to publish and exchange their spatial datasets. Published datasets need to be exchangeable and accessible according to INSPIRE specifications when covering the INSPIRE Themes. The Ministry of Economic Affairs set up services mapped to the data specifications for Natura2000 defined in the protected sites theme that is part of INSPIRE. Since the Natura2000 dataset existed before the INSPIRE-specifications were around the dataset is mapped to the INSPIRE data specifications to be compliant to the directive. In the following step the dataset is published as view and download services in the Dutch national spatial data infrastructure using the PDOK platform.

This example shows how policy set in a European directive and transposed into national legislation is a legal driver to publish spatial data in a specific format and service. The resulting map services are available for use by the public since the spatial data are available in an exchangeable and accessible form according to publicly known content and open formats.

4.5. Case 4: Land parcel Identification System (LPIS)

Since 2005 each member state is obliged to design and develop its own Integrated Administration and Control System (IACS) to support the European agricultural area based aid system. The Land Parcel Identification System (LPIS) forms an important part of the IACS and uses cadastral maps or other cadastral information, spatial data and parcels at the farm level and satellite or airborne ortho-images. Each LPIS consists of a spatial component (e.g. boundaries, coordinates, surfaces) and administrative properties (e.g. ID-number, eligible area for farmers declaration, crop code). LPIS has to channel all area based agricultural aids; the corresponding financial value exceeds €41B for 2009 and failing of the system can lead to severe financial consequences for the member states. Member states are fined when they declare inappropriate areas, i.e. areas double counted, or not eligible according to the rules and fines are generally calculated as a percentage of the total financial value for a certain member state, which can easily add up to a few million euros. So it is important the National LPIS should be sufficient accurate.

LPIS has two main functions:
1. the unambiguous localisation of all declared agricultural parcels by farmer and inspectors,
2. and the quantification of all eligible area for farmer declarations and cross-checks during the administrative controls by the paying agency.\(^{23}\)

Whereas unambiguous localisation of parcels aims to reduce the risks for double declaration and quantification of eligible area aims to minimize over-declarations. Furthermore it is emphasized that any well-functioning LPIS will greatly facilitate operations by farmer, inspector and paying agency, resulting in a better performance.\(^{24}\) Obviously, a better LPIS substantially improves IACS effectiveness and management of EU Funds.

In the Netherlands, the AAN-database (Agricultural Area of the Netherlands) forms the basis for the reference parcels inside the Dutch-LPIS. However, the execution of the LPIS and the thresholds prescribed, lead to many questions within the Netherlands and numerous other member states.\(^{25}\) In 2010 The Joint Research Centre issued a quality framework that described the minimal required quality of the reference database. In 2012 the Dutch ministry of Agriculture asked for an evaluation of the quality framework. The conclusion of the evaluation was that the LPIS Quality framework is an important step forward towards more insight into the quality of LPIS’s, but that the framework in its current shape does not sufficiently take the political context of member states into account. Furthermore still several important quality principles are lacking in the framework and the background documentation is poorly organized. The Dutch ministry has communicated these issues with the Joint Research Centre and they might take them into account in a revision of the framework.\(^{26}\)

In this case it is clear that EU-regulations have a large impact on generating spatial information, whereas possible fines influence the quality aspects.

\(^{23}\) W. Devos, LPIS quality inspection...

\(^{24}\) W. Devos, LPIS quality inspection...


4.6. National Risk Map of the Netherlands

In 2000 in Enschede, located in the east of The Netherlands, an explosion took place in a Fireworks enterprise. In total 23 people were killed, 950 injured and an area of 42 ha completely destroyed. Rescue teams did not have a good overview of the area. After the disaster it was decided that for all Dutch provinces Risk Maps were to be made to have a good overview of the area and potential casualties whenever a calamity would occur. Also the map made it possible to take measures at forehand to prevent excesses. A year later the September 11 disaster happened in New York that worldwide led to an increase of measures to prevent terrorist actions.

When in 2005 the first risk maps were finalized a discussion started at the Administrative level dealing with the question whether Risk Maps could be abused by terrorists especially the effect contours indicating the impact of a disaster. At that time it was decided to use a Model-Risk Map to present a number of predetermined calamities. There are 18 categories of which 13 can be presented on the National Risk Map, leaving 5 categories not exposed due to risk of terrorism. With this decision safety prevailed over the threat by terrorism, mostly because of the argument that terrorists could find the sensitive information anyway. Currently the Risk Map is part of the national law on safety regions (wet Veiligheidsregios). Provinces are responsible for creating and publishing these maps as is stated in the ‘regulatory requirement provincial risk map’ (Regeling Provinciale Risicokaart).

5. Results

The cases described all show a type of impact by one of more legal arrangements on the use of geo-information. We categorized the type of impact according to the division made by Janssen into legal arrangements acting as a driver or as a limitation or both. Furthermore we indicated which factor from the framework was mostly affected by the impact of the legal arrangements. In this chapter we discuss the categorization per case.

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28 K. Janssen, A legal approach to...
5.1. Spatial Plans

In this case the New Spatial Planning Act of 2008 is a strong driver that clearly accelerated the use of geo-information within all municipalities of the Netherlands. Of course the traditional spatial plans were also geo-information, but the obligatory digital, comparable and exchangeable spatial plans caused a complete change in the working process which entailed that more staff members of municipalities were forced to use geo-information systems and - information. Before the new Act municipalities often hired an agency to draw up their spatial plans according to the design of that agency, but now everybody who needs or likes to consult the map has to use the portal with a predefined design. Without the new Act obliging every municipality to go to digital and exchangeable maps, this change would have taken much longer if it had happened at all. The new Act interacts with the use of geo-information on the factors dissemination, quality assurance, transparency and acceptance of the framework. Dissemination is positively influenced because all municipalities are forced to change their working process and deliver digital, comparable and exchangeable plans, secondly the plans are uploaded to a platform for viewing and comparing with other spatial plans by citizens and policy makers. A clear description of the format of the plans was given (digital, object oriented and harmonized with use of an information model) which positively affected the factor quality assurance. Transparency is also positively affected because the spatial plans are more easily accessible via internet (and there is no need any more for visits to the town hall including waiting times). Furthermore the plans are made according to a geo-standard, which means that the objects on different plans are comparable. This final issue also influences the factor acceptance in a positive way, since harmonization increases the ease of use.

5.2. Geo-Information Agricultural Enterprises

The legal registration of animals and farmland can be seen as a driver, since it took care of the collection of the data. Without this law this data would not be available and therefor the geo-database could not have been made. This law positively influences the factors transparency and dissemination. On the other hand the law on privacy is a limitation in this case and seriously hinders the transparency since the data can only be used in a aggregated form and it also negatively influences dissemination, because the data can only be used for certain purposes.
5.3. National Road Network

In this case the law acted as a driver since the consent to declare the dataset of the national Road network as open promoted the use of this dataset. Despite objections of private industries the Act on freedom of Information acted as a ground to deny the requests from third parties. Once open it specifically affected the factor dissemination, since it is easier to access and use it.

5.4. Land Parcel Identification System

In the case of LPIS the acts and decrees behind this system have been a driver to use more and improve the quality of geo-information. The EU has imposed serious fines if the LPIS is not performing according to their requirements and new control and evaluation methods have been developed in the Netherlands to prevent that from happening. This has positively affected the factor quality assurance.

5.5. Protected Sites

In this case the dataset of the protected sites is made INSPIRE compliant and this can be seen as a driver for the use of geo-information. With use of data specifications (the implementing Rules of INSPIRE) the dataset is harmonized with similar European datasets. This extents the use of the dataset, since it can be used in comparison to other European countries and it improves the ease of use because all the datasets use the same ‘language’. This means that the factors Dissemination and Transparency were positively affected.

5.6. Risk Maps

In the case of the Risk Map we showed the antagonism between threat of terrorism and the visibility of potential risks. In this case exposure is judged more valuable. Nevertheless a limited number of categories is left out because of safety reasons. If the threat of terrorism had prevailed completely it would have specifically hindered the factors transparency and dissemination.
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Table 1. Relationships between the use of geo-information and legal aspects

6. Discussion/Conclusion

The analyses show that legal arrangements can be a driver as well as a limitation, but that the legal arrangements in these cases mostly operate as a driver. Although we recognize that the people directly involved in the process might have been frustrated since having to adapt to new processes often felt as a step backwards. Additionally we wonder, though, why it often still takes a long time for improvements in the use of geo-information to become visible even when legal arrangements act as a strong driver? How long would it have taken for those changes to appear without legal arrangements? The ministry of Housing started their preparations for the new legal act on spatial planning and the promotion of the exchangeable and digital maps in 2003, while it finally got obligatory in 2010. The preparations for implementing INSPIRE started in 2007 when the directive came into force and are still going on and will continue until at least 2020.

In our conceptual framework we find that 4 factors determine the use of geo-information and in the analyses we see that that the legal arrangements generally only focus on one or two of those factors. We wonder what the effect will be if all 4 factors are taken into consideration when new legislation concerning the use of spatial information has to be made.

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Nevertheless, in the case on spatial planning attention was paid to all four aspects, it still took 7 years from the start of the preparations till the point that the act was fully implemented, but at one hand the new Act was proposed at a late phase in the process and on the other hand this process involved a complete revamp of the working process and that is very time consuming.

Using legal arrangements as a driver to the use of geo-information has the advantage that governments generally also have to provide budget to stimulate the process. In the case of spatial planning the Ministry set up a program to raise awareness and stimulate the changeover to a digital planning process. When this was not sufficient they started investing in change-management in order to break the resistance on the work floor and decided to oblige the changeover by law. In the case of LPIS the threat of severe fines from the EU appeared to be a strong driver to improve the quality aspects of the LPIS in order to save money in the long run. In order to prevent fines of a few million governments are willing to invest. These kind of financial incentives can influence the driving force of the legal arrangements.

In the case of the geo-database on Agricultural Enterprises the law on privacy is the main limitation to the use of the geo-database. Janssen and Crompvoets describe this issue as well and indicate that privacy authorities around the world struggle with reconciling the needs of government bodies for sharing geographic data with the protection of the privacy of the citizen, leading to uncertainty as to what extent geographic personal data can be shared and re-used. They suggest that more research is needed into how the geographic component of the data involved can be separated from the personal component while still maintaining the fitness-for-purpose of the data, or how the citizen’s privacy can be guaranteed while sharing the geographic data.

In the case of the risk map, law acts as a limitation to safeguard national safety. A similar case is described by Adhikari he discusses the possible threats to national security in India caused by the dissemination of High Resolution (HR) satellite images. The Indian policy is to restrict access to high-resolution satellite images to reduce possible threats, but he questions the validity of such a measurement, since generally the same kind of data can also be obtained from

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30 K. Janssen, and J. Crompvoets, Intruduction [in:] K. Janssen and J. Crompvoets (eds.), Geographic...

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the private sector. He argues that it is not the HR data but their use for a specific purpose that poses the security threat. He advises to open up data, but under the condition that specific and strict enactments is necessary to punish any infringements on national security. Janssen en Crompvoets\textsuperscript{32} also suggest that research into the reasoning whether national security can be considered to be a reason to limit access to data.

Although the framework was developed by Vonk\textsuperscript{33} to evaluate the implementation of geo-applications and later on adapted to evaluate the use of geo-information in environmental policy,\textsuperscript{34} we feel it is a useful framework to evaluate the impact of legal arrangements on the use of geo-information, because the use of geo-information remains the primary goal.

To conclude:

- If legal arrangements are meant to promote the use of geo-information they should not only focus on one aspect but encourage all four aspects in order to improve the use of geo-information.
- Financial incentives can significantly influence the driving force of the legal arrangements.
- In the cases where legal arrangements act as a limitation to the use of geo-information more research is needed to properly deal with it (privacy issues) or to investigate whether it should be considered a limitation (national security).
- The framework is a useful tool to evaluate the impact of legal arrangements on the use of geo-information.

\textsuperscript{32} K. Janssen, and J. Crompvoets, Intrduction [in:] K. Janssen and J. Crompvoets (eds.), Geographic...


\textsuperscript{34} L.A.E. Vullings, J.D. Bulens. N. Dessing, M. Danes, Use of Geo-Information in Environmental Policy: Limitations, Advantages and Challenges\textsuperscript{”} has been accepted for International Journal of Agricultural and Environmental Information Systems, 2014.
Chapter XII. Geoinformation and Development in Transitional Economies: Case of Georgia

1. Introduction

It is universally acknowledged that abundance of information became one of the most characteristic traits of the modern society and, consequently, the historical time of our presence in this world is commonly labeled as ‘the information era’ or ‘the information age’. Along with food and drink that assures our physical/biological existence, information became probably the most indivisible attribute of a life cycle of human beings. Since very long, perhaps from the emergence, humans firstly are information carriers; a generalized portrait of a modern citizen of any part of the world would definitely comprise virtual information in form of knowledge and ideas, on the one hand, and devises (at least one) of capturing and disseminating information – mobile phone, laptop, digital planchette, netbook, etc., on the other hand. Availability of such devices becomes more and more common, although up to different extent, for almost all population groups and strata throughout the world.

A large portion of information is land or space related and “[…] because almost all activities have a spatial footprint this implies to a large extent geo-spatial information.” Hence, geo-spatial information or, in short, geoinformation is an essential resource for plenty of people for conducting/maintaining their lives and activities.

The ‘information’ phenomenon, including ‘geoinformation’, is closely related with many essential conceptions such as ‘freedom’, ‘knowledge’, ‘innovation’, ‘technology’, ‘governance’, etc. ‘development’ is one of such conceptions that directly associates with ‘Information’ – its availability, reliability, accuracy, transferability, speed of turnover, etc. Obviously, different countries, societies and economies worldwide experience different levels of development where information component plays very important role in achieving this or that level. A status of geoinformation, capacity of its production, availability for public institutions

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and wider population, quality of geodata, speed of dataflow, etc. in particular countries strongly influence levels and trajectories of their overall socioeconomic development.

This chapter deals with issues of geoinformatics in a newly independent country of Georgia that regained the independence after collapse of the Soviet Union in 1991. Georgia has a population of less than 4.5 million and GDP per capita slightly more than USD 5,000. The purpose is to discuss to which extent modern geoinformation facilities have triggered and facilitated development of a small, non-welfare country, and to illustrate how Georgia has benefitted from production and usage of geo-spatial data and implementation of geoinformation technologies in different sectors of economy. It also discusses what role geoinformatics could play in further improvement of socioeconomic performance of the country.

2. Setting a context: Is Georgia part of a Fast or Slow world?

Development of nations in the world could be assessed by different – economic and noneconomic – measures. Among them availability and reliability of different sorts of information, frequency and speed of dataflow, provision and usage of modern information and communication technologies (ICT) play very important role. According to these measures the division of modern societies into ‘the Fast World’ and ‘the Slow World’ is experienced. The purpose behind such division is to emphasize that in the modern global competitive socioeconomic system the enterprises, states and entire regions “find themselves in an endless race to seek out new markets and reduce what is known as the ‘turnover time’ of capital: the amount of time it takes for money invested to fund the costs of new production to be returned with a profit through the sale of goods and services. In the global capitalist system, time costs money, and the inevitable result is a steady acceleration in the pace of life”. A pace of turnover of information, like turnover of capital, as an undividable part of economy and business, becomes crucial for countries and companies for reaching success in tough market competition.

Among various information trafficking through Internet, which is definitely the leading edge of the fast world, and all other communication channels, geoinformation is one of the most valuable and highly demanded. Geoinformation is essential for fast and efficient operation of competitive free markets. This is especially true for land and real property markets where almost all transactions need

precise and reliable information on land plots, buildings, utilities, etc., i.e. objects with geographical features. The role of geoinformation is essential for military purposes, transportation sector and navigation, infrastructural facilities like utility networks, pipelines, public services, education, etc. Provision of this kind of spatial information always depends on existence and application of appropriate tools, techniques and technologies for capturing, processing, analyzing and presenting spatial data.

The complexity of possible measures, large number and distinct character of feasible variables, makes very difficult, if at all possible, precise measurement of a status of each particular country regarding its belonging to the fast or the slow worlds. However, one could clearly expect that geographically the fast world coincides with the core, developed economies abounded with (geo)information facilities, while the slow world embrace the rest of countries that are undeveloped and/or developing. A simple illustration of correctness of such expectation might be an indication of levels of computerization throughout the world, percentage of internet users or monetary expenditures in IT sector done by countries, etc.

**Figure 1.** Level of internet penetration by countries

![Internet Penetration World Map](http://en.wikipedia.org/wiki/File:InternetPenetrationWorldMap.svg)  
**Source:** http://en.wikipedia.org/wiki/File:InternetPenetrationWorldMap.svg, author J. Ogden, *InternetPenetrationWorldMap*

The observation of couple of such characteristics which show relatively low percentage of internet users in the country (see fig. 1), etc., reveals a fact that Georgia is still far away from the leading countries that represent the fast world, in terms of connectivity with mainstream global networks and is not sufficiently ‘plugged in’ in the worldwide information systems. Likewise, majority of the so called transitional economies also belong to the slow world rather than to the fast

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one. Although, during last decade or so, these countries of Eastern Europe and former Soviet Union have undertaken impressive efforts for designing and implementing modern information systems and advanced technologies as a necessary measure for assuring an efficient transition to market economy, many of them didn't manage so far to join the advanced countries of the fast world.

Why it happened that the post-Soviet countries still lag behind and scramble to reduce a gap with the fast world, and what puts Georgia in a range of such countries? The following section will try to answer some of these questions.

3. Why Georgia was/is slow?

Soviet legacy and post-Soviet reforms

Soviet rule ended a short-term independence of Georgia (1918-1921) which emerged after fall of the Russian Empire, and brought some universal conditions of development, or rather rigid frameworks, which had been applied all over the USSR. The Soviets had established an extremely centralized management system in general, when an ‘administrative (political) centre became the major seat of decision-making on practically every issue concerning the territory under its jurisdiction...’. Additionally, the State ownership of land became the only form of land ownership.

Along with these widely acknowledged (see e.g. Jeffries 1993, Kornai 1992, Lerman et al 2004) universal conditions the Soviet information policy deserves a special attention. Information became a key factor of ideological struggle of the highly centralized system, where everything was decided in and controlled by Kremlin, and together with military power served as a main argument for propagating advantages of the Soviet system compared to capitalist one to the own population and potential allies. In order to assure efficiency of such propaganda the Soviets implemented the ‘Iron Curtain’ politics, putting physical and information barriers between itself and the rest of the world. The physical and informational isolation of Soviet people from the outside world lasted throughout the entire Cold War period (from 1947 to 1991). The strongly centralized Soviet Communist political system established strong monopoly on information production and dissemination, and implemented severe regulations for its usage by citi-

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zens and institutions. Apparently geoinformation was the most restricted and least available for wider public and it corresponded to very limited freedom of mobility of people not only outside of the country but also internally.

In order to illustrate how the above-presented general statements were implemented in reality, we draw forward few examples: the Soviet state was producing very precise and high quality spatial data only when it was assigned for and used by military and defense-related purposes; its usage was strongly restricted for civil sector. Meantime, geo-spatial information for mass consumption was very general, incomplete and often distorted from reality. For instance, topographic maps didn’t show so called ‘strategic objects’ that were supposed to have ‘defense’, and/or ‘security’ functions. As a result of such approach, sometimes the entire settlements – industrial, research and mining centers producing goods and services for so called Military Industrial Complex (Voenna-promyshlennyi kompleks (VPK) – in Russian), as well as those in border areas, and places of exile – were erased from maps. Such settlements and their names were not known to the great majority of the population and had been operating under severe secrecy. The people living and working in those places could get correspondences not via regular posting addresses but through encoded system of so called post boxes (pochtovyj yashchik) numbered specifically for each ‘secret’ settlement, and their possible mobility was very strictly limited and controlled. Along with hiding information related to such areas and settlements, the physical approach to them was also strongly or completely restricted. For instance, today’s popular tourist seashore zone in Georgia that extends from the city of Batumi westwards to the Turkish border was almost inaccessible to the Georgian population, as it had a status of a border area with unfriendly NATO member country. An access in such and the similar districts had been arranged only through strict permission system controlled by the Soviet defense and security entities and were less convenient than many modern rigorous visa regimes. The reason, at least officially declared, behind such policy was a necessity to hide national security sensitive information from hostile forces outside the country and inside it.

Driven by the policy of furtiveness and ideology of overall informational control, geoinformation became partially luxurious and partially dangerous item for many Soviet people who needed to produce and work with spatial data. Geographers, city planners, land arrangers and others could hardly if at all get basic detailed large scale maps for their research and inquiries, while systematic labor in the fields of geodesy, cartography, photogrammetry, and related professions made people ineligible to travel abroad (there was even a special term in Russian – nevyezdnoi – for such people) for several years because of knowing secret information. The whole cartographical production of certain map scales and thematic contents had been ‘closed’, i.e. restricted in usage, by the argument
of their secrecy, assigning corresponding classification to them.\textsuperscript{7} According to some experts\textsuperscript{8} topographic maps of certain areas that were described/drawn and produced using costly aerial photography and precise field measurements by one geodetic enterprise (e.g. located in Tbilisi, Georgia) of the USSR used to be sent to another enterprise (e.g. in Tashkent, Uzbekistan) for distorting it to fixed extents. Correspondingly, the further products (e.g. tourist maps) produced on the basis of such topographic maps were respectively distorted.

The policy regarding geoinformation had not been changed cardinally during the entire Soviet time, even with the emergence of new technologies such as satellite imagery, multiplying facilities (e.g. copy machine), computers, etc. Such a rigidity and inflexibility of the state policy sometimes caused anecdotic situations; one of such cases is still in our memory: a geography professor of Tbilisi State University that travelled to the USA in early 1980s in the frames of an exchange program, brought a satellite image of Georgia which he bought in a store by a petrol station, and put it on the wall in his department. The rumor spread around about this acquisition and many curious colleagues started to come to see a new, unusual product, until a security service of the university confiscated it arguing that it contained secret information.

\begin{figure}[h]
\centering
\includegraphics[width=\textwidth]{figure2.png}
\caption{Geoinformation secrecy in the Soviet cartography: even harmless topographic maps were given the classification of ‘Secret’}
\end{figure}

\textsuperscript{7} The degree of secrecy was differentiated from ‘Dlja sluzhebnogo pol’zovaniya’ (i.e. for business purposes) to ‘Sekretno’ (secret) and ‘Sovershenno sekretno’ (top secret), according to map scales, contents and detail of presented information.

\textsuperscript{8} Interview with Mr. Merab Nadaraia, a former director of the geodetic enterprise in Tbilisi.
The above-described geoinformation policy with lots of secrecy and restrictions didn’t facilitate an establishment of transparent and effective governance and management systems regarding land and territorial resources, and related information in the USSR. The access to land and resources was extremely complicated for individuals, and a quality of environment and human life usually didn’t meet needs of population. Land-related data was hardly accessible and mostly inaccurate. Technologies applied in civil land administration were usually primitive and obsolete.

The break-up of the Soviet Union in 1991 created new political and socioeconomic conditions and priorities for ex-Soviet transitional countries for a transition from command to market economy, from authoritarian to democratic governance system. Although different countries have chosen quite different ways of transformation, all of them in this or that degree experienced reformation of their (geo)information policies, some staying for longer time under influence of Soviet legacy, while others tried to faster move closer to internationally accepted patterns and approaches. Georgia found its place in the avant-garde of the reformers regarding (geo)information policies and norms/rules, which was clearly manifested by abolition of secrecy on spatial information in the ‘Georgian Law on Geodesy and Cartography’ of 1997 and officially adopting the international geodetic coordinate system instead of the Soviet one.

Actually, the changes in geoinformation policy in Georgia were determined by dramatic reformation of economic sectors and areas of public activities, and were almost universal and overwhelming. However, to our opinion, the leading edge of changes included land administration and real property market, followed by construction, town planning and several public services like transportation, utility provision, etc. Hence, in the below sections we try to reveal the importance of geoinformatics in the above-mentioned sectors.

4. Land reforms and geoinformatics: building a modern land administration system

Arguably, land reforms that started in Georgia from 1992 triggered shifts in geoinformatics much stronger than anything else. On the other hand, geoinformatics...
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national support became absolutely crucial for implementing new systems that occurred during and after land reforms. The systems of land cadastre and property registration, along with some other segments of property market (e.g. planning, building and development) have become the major customers and users of the newest geoinformation technologies and modern survey approaches.

Initially, land reforms have been implemented for establishing a free real property market, that was absent in the USSR, by means of privatizing formerly state-owned land plots and other property units to the individuals at first in rural areas (since 1992) and later in urban places (since 1998) too. The free-of-charge and equitable distribution of almost 1 mln ha of formerly state-owned and collectively used agricultural land parcels to individual households created almost 3 mln rural land parcels and around 800,000 private landowners in relatively short period of time (less than 10 years). In addition, many real estate units (apartments, houses, enterprises, etc.) and land plots have been privatized in cities and towns.12 The relatively fast emergence of numerous real estate units gave a strong push to establishment of a real property market, on the one hand, and caused an acute necessity of introducing a modern land administration, on the other hand. The latter was traditionally acknowledged as of very high importance for legal security of ownership, land market development and overall economic progress, as without effective access to secure property rights, national economies cannot progress and sustainable development cannot be achieved. Today, the prime objective of a land administration system is seen as facilitating the operations of the land market.14

The implementation of a modern land administration system in Georgia became possible only by help of international donor organizations, as the country by that time (in 1990s) didn’t possess any relevant know-how, sufficient funds,

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11 The equity principle foresaw the distribution of maximum of 1.25 ha of agricultural land per household.

12 J. Salukvadze, Geoinformation Technologies in Land Management and Beyond: Case of Georgia. Shaping the Change, Proceedings of XXIII International FIG Congress, 8-13 October 2006, Munich, Germany, p. 18. FIG office, Lindevangs Allé 4, Frederiksberg, Denmark. Digital edition; available at: http://www.fig.net/pub/fig2006, as of 28 January 2014; J. Salukvadze, Good Governance...

13 UN Economic Commission for Europe has adopted the term “Land Administration” to describe the process of recording and disseminating information about the ownership, value and use of land and its associated resources. Land administration includes cadastre, land registers, land consolidation, valuation and land information systems.


15 Since the mid-1990s several international donors – the World Bank, UNDP, EU, the German GTZ and KfW, the American USAID, and the Swedish SIDA – have been financing the projects on implementing cadastre and land registration systems in Georgia.
capable institutions, skilled personnel, proper technologies and techniques for fulfilling this task by own resources. However, As a result of joint local and international efforts in the field of land administration in less than 10 years time the provision of up-to-date parcel-based digital geoinformation became available for almost the entire territory of Georgia (see fig. 2). This fact could be seen as a dramatic change after Soviet-time deficit of spatial information. It is notable that similar donor assistance has been offered to almost all other post-Soviet countries, which proves that international community fully acknowledged the importance of creation of proper cadastral and property registration systems in the newly independent countries.

**Figure 3.** Donor-assisted project activities in Georgia from the mid-1990s to the mid-2000s

<table>
<thead>
<tr>
<th>Projects</th>
<th>KfW</th>
<th>USAID</th>
<th>IFAD/WB</th>
<th>UNDP/EU</th>
<th>GTZ</th>
</tr>
</thead>
<tbody>
<tr>
<td>Used Software</td>
<td>ArcGIS</td>
<td>LandCad</td>
<td>MapInfo</td>
<td>ArcGIS</td>
<td>AutoCAD, EZSI</td>
</tr>
<tr>
<td>Spatial data collection methodology</td>
<td>Aerial survey, orthophoto images, line mapping and cadastral survey</td>
<td>Cadastral mapping</td>
<td>Aerial survey and cadastral mapping</td>
<td>Orthophoto images and cadastral survey</td>
<td>Aerial survey, line mapping and cadastral survey</td>
</tr>
</tbody>
</table>

**Source:** Compiled by the authors

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The above-mentioned process was accompanied by introducing of modern geoinformation technologies which was a revolutionary step in development of spatial data production for Georgia. Although, in the first phase of implementation (from the mid-1990s until the early-2000s) of unified national land cadastre and property registration system the donor-assisted projects tried to introduce quite different and sometimes contradictory concepts and approaches with the involvement of different surveying devises, graphical software, data formats and quality standards, etc., eventually, thanks to elaboration of a common concept\(^{16}\) and better coordination of the donors, the implementation of a good operational system was secured. This system, besides an enhanced institutional set-up and financial viability of the state property registration body – the National Agency of Public Register (NAPR) – assured realization of the following objectives:

- Introduction of modern survey methods and application of relevant geoinformation technologies and technical facilities in cadastral and property registration activities;
- Integration of different information sources and data formats captured by different donor-assisted projects into unified and standardized database(s);
- Achieving sustainability of the system, especially after ceasing the external assistance, by means of efficient geo-data management and constant system update.

The building of a new cadastre and property registration heavily involved modern geoinformation techniques and ICT\(^{17}\) tools that were innovative for the Georgian reality. The creation of nation-wide parcel based cadastre envisaged measurement of several millions of land plots and real estate objects throughout the country, which required proper base maps of sufficient accuracy, fast and precise measurement technologies, efficient tools (hardware and software) for fast and quality processing and storing of data, etc. Taking into consideration the fact that old Soviet maps and data were mostly incomplete, inaccurate and unavailable in digital format, as well as referenced in internationally non-standard coordinate system and contextually inappropriate for property cadastre purposes, the building of a new database started actually from a scratch and involved the following innovative, by that time, methods of data capture and processing:

a) **Aerial survey** covered over 35,000 km\(^2\) of economically active territory of the country (out of 69,700 km\(^2\) of the total area of Georgia). The following flight scales had been applied: 1:5,000 for cities, 1:12,000 for rural settlements and agricultural land, and 1:35,000 for thinly populated mountainous and forest

\(^{16}\) In 2004 a ‘Concept and Business Plan for Real Property Registration and Cadastre in Georgia’ was elaborated.

\(^{17}\) ICT - Information and Communication technologies.

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areas. For the rest, mostly security prone (e.g. border areas) and unpopulated territories satellite imagery was used.

b) **Orthophoto mosaicing and vector/line mapping** was based on further processing of aerial photos and satellite images. Production of orthophoto mosaic and line maps included the fixing of geodetic reference points. Maps were produced in scales: 1:500 and/or 1:1,000 for cities, 1:2,000 for small towns and rural settlements, 1:5,000 for agricultural land. In total the orthophotos had been produced for nearly 30,000 km².

c) **Cadastral survey** for defining and fixing property boundaries on the ground, along with collecting documents proving ownership rights. Most of cadastral measurements have been done using GPS-based ‘Digital Plane Tables’ (DPTs) and total stations (in densely built urban areas), which secured high accuracy and high speed of measurements. It is noteworthy that unprecedented number of 20 to 30 DPTs, then quite new and advanced technical devise, had been working in the fields almost daily during 2001-2007, in order to systematically cover territories by cadastral measurements in form of ‘blanket coverage’. Cadastral survey was accompanied by property owners’ investigation that reckoned for digital copying and filing of legal documents in a digital database.

d) Processing and organizing field data into interlinked alphanumeric and graphical databases implied the use of both standard (e.g. MS Office, ESRI ArcGIS) and specially developed (e.g. RegLand++ – for registration, Edit/search engine – for object identification and update) geoinformation (GIS) and other software. Finally all data was converted and stored in a unified geoinformation database (GeoDB)¹⁸ organized by administrative-territorial units – municipalities, and big self-governing cities.

Such a bulk of work, along with technical and technological innovations, required sufficient number of skilled personnel and it was non-existent in the country. Therefore, over 500 persons had been trained on job in field and for data processing using GIS. Besides training of technicians, German KfW-funded project facilitated building-up of about 40 private surveying companies familiar with using DPTs for cadastral surveying and editing data in GIS format. These efforts resulted in a formation of sufficient number of companies and specialists for a large field and office workload during systematic cadastral survey and then sporadic registration of properties. Remarkably, at least half of these companies and specialists that acquired good knowledge and skills during international-assisted

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¹⁸ GeoDB allows integration of the different features of objects in one database, which can be implemented for land cadastral and property registration purposes simultaneously. At the same time, existence of the additional features (layers) allows to use the same information in different special applications, such as soil cadastre, physical planning, environmental monitoring, statistical and spatial analysis, assuring by this the multipurpose use of data.
projects stay in the surveying and property registration market up today, assuring sustainability of land administration system, on the one hand, and launching a profitable business, on the other hand.

The above-presented brief description of major technical features of the Georgian cadastral and registration system that might be seen as a ‘Georgian model’ of geoinformation management is visualized in fig. 4. It reveals that the concept of land administration, particularly in the part of cadastre and registration, is based on (i) efficient management and maintenance of land related data, assuring its **multipurpose use**, and (ii) the use of **modern technologies** and employment of well-trained personnel in land operations. These aspects are discussed in more details below in this chapter.

**Figure 4.** Geoinformation concept of the multipurpose land administration system in Georgia (2006)

![Geoinformation concept diagram]

**Source:** J. Salukvadze, *Geoinformation Technologies*...
5. Geoinformation in spatial development and public services

The mass production of properly georeferenced parcel based spatial data gave a strong impulse to its usage in several fields outside land administration. Physical planning and construction activities became major users, which implied application of digital graphical software packages and modern survey techniques in designing and planning from constructing separate buildings to developing vast urban areas and the entire settlements. Land cadastre data proved to be a universal basis for such exercises and by adding 3rd dimension (altitude) to 2-dimension cadastral information, architects and town-planners comfortably acquired necessary framework for elaborating their spatial development and building projects.

It was not only architects and town-planners professions who benefited from the creation of digital geoinformation; the regular citizens have got an opportunity of reaching spatial data and using them according to their needs. For instance, after adopting a new Master Plan of Tbilisi in 2009, an interactive city map appeared on the web-page of the city hall, which allows everyone to search places of their interest at parcel level throughout the city, and openly provides information on a legal status of land, applicable land-use type, building permission (if any), ongoing building activities, etc. Such information, though not completely eliminating all concerns and claims of citizens, makes the system more transparent, understandable and thus acceptable for the population.

Since the mid-2000s in Tbilisi and some other bigger cities the utility services like water, electricity and gas provision, sewerage network and waste management became fully privately run or maintained by municipal enterprises. The respective companies and enterprises, along with car parking company (c-t-Park) in Tbilisi, also became permanent users of cadastral geoinformation, on the one hand, and developers of thematic spatial data layers for the multipurpose GeoDB, on the other hand.

Another good example of efficient usage of geoinformation is a public bus company in Tbilisi that together with the city hall maintains passenger traffic and respective services. In the situation when the international quality/standard navigation system is not yet available in Georgia, the company installed GPS devises in the busses and secured transmission of data to bus stations, where on tableaus exact time to arrivals in minutes is indicated in two languages – Georgian and English (see fig. 4). This novelty is very much appreciated not only by locals but also by foreign visitors of the city.

Figure 5. A tableau on a bus station indicates numbers of buses, itineraries, minutes to arrival, as well as other useful information

Source: photo by J. Salukvadze

The cases of usage of geoinformation are not limited to the above-mentioned; plenty of other users emerged during recent years and their number is constantly growing. Administrative and self government bodies, police departments, tax authorities, environmental organizations, banks and insurances, education institutions, economic sector, private companies, NGOs, international agencies, etc. are not only using geoinformation in their activities but also often act as producers of new information.

In order to enhance territorial coverage, quality and availability of geo-spatial data a project on creation of the Georgian Continuously Operating Reference System (CORS) started in 2010. The project is designated for diverse types of users – from amateurs and beginners up to professionals. Geo CORS is the network of the permanently mounted reference stations located at the geographically important places within the links between each other and a central station. This gives possibility of observing and monitoring of all connections to CORS users. On the other hand, all information is stored in a database which is visible for administrators.

One of main benefits of this system is a possibility of analyses of land market development and assessment of the most active lands and properties of survey-covered areas.
The aspiration of Georgia to harmonize its space with European one, including (geo)informational coherence, motivates the relevant institutions such as NAPR and the State Department of Geodesy and Cartography to follow international standards of development. Recently Georgia started the creation of the Georgian National Spatial Data Infrastructure (GNSDI). GNSDI is organized/designated according to the Eurogeographics’ requirements and INSPIRE directives. First step envisaged preparation of the Euro Global Map (EGM), which is now available on the Eurogeographics portal (www.eurogeographics.org). Currently another phase of Euro Regional Map (ERM) construction is underway. Table 1 presents GNSDI data description.

**Table 1. Contents of Georgian National Spatial Data Infrastructure (GNSDI)**

<table>
<thead>
<tr>
<th>Theme</th>
<th>No.</th>
<th>Layer Name</th>
<th>Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>Boundaries</td>
<td>1</td>
<td>Country Boundary</td>
<td>Poly line</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>Country Boundary</td>
<td>Polygon</td>
</tr>
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<td></td>
<td>3</td>
<td>Administrative Boundaries</td>
<td>Poly line</td>
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<td></td>
<td>4</td>
<td>Administrative Boundaries</td>
<td>Polygon</td>
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<td></td>
<td>5</td>
<td>International boundary crossing points</td>
<td>Points</td>
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<tr>
<td>Populated Areas</td>
<td>6</td>
<td>Settlements</td>
<td>Points</td>
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<td></td>
<td>7</td>
<td>Settlements</td>
<td>Polygons</td>
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6. Implication of geoinformation in public governance improvement

The post-Soviet socioeconomic reformation and introduction of new (geo) information policy went along with dramatic changes in forms and methods of governance in Georgia. After deeply corrupt, vertically structured and inefficient governance of the 1990s – the early 2000s that was (and still is) typical for all ex-confederate countries except for the Baltic States, Georgia made a spectacular breakthrough. Since the mid-2000s, thanks to the cardinal reformation of police and other power-implementing bodies, successful fight with corruption,\textsuperscript{20} strength-


\textit{Joseph Salukvadze, Vladimer Chkhaidze}
enabling democratic institutions, etc., the influential international agencies, such as the World Bank, the International Finance Corporation, the Heritage Foundation, Transparency International and others, systematically have been placing Georgia quite high in different international ratings regarding economic freedom, business environment and so forth. For instance, in 2012 Georgia found a place in a range of Baltic States and East European countries, far ahead of the ex-Soviet counterparts, according to Corruption Perception Index\(^\text{21}\) (rank 51 out of 176, score 52 out of 100), Economic Freedom\(^\text{22}\) (classified as ‘Mostly Free’, rank 21 out of 177, score 72.2 out of 100), and Doing Business ranking\(^\text{23}\) (9th worldwide out of 185). Although one could criticize methodologies applied in these surveys/studies and doubt their results, most people agree that they more or less correctly indicate status and trends of changes in this or that country, and provide a good platform for comparisons. Consequently, we rely on these ratings and scores as general indicators of progress of Georgia in regard with corresponding fields of governance.

It is beyond the scope of this chapter to discuss changes in governance at general level in details; however, we argue that along with introduction of reasonable information policies, the implementation of modern geoinformation technologies played a significant role in the above-mentioned progress. Geoinformation reform twinned with better institutional arrangement, introduction of progressive methods of management and administration, and, what is the most essential, political will to reform according to the best international standards resulted in spectacular improvements. Below we try to draw forward some examples of such improvements.

Getting back to land administration and land governance issues, the remarkable changes towards the implementation of client friendly approaches and modern management methods should be outlined. After concentrating all property registration procedures in one institution – NAPR (previously it was scattered among 2 or 3 bodies) in 2004, the implementation of ‘one-stop shop’ approach became possible. The acquired geodata and application of modern geoinformation technologies and tools, including special production software developed by NAPR IT unit, allowed conducting all activities in digital format using easy and transparent procedures with outsourcing to the private sector some essential tasks as cadastral survey and technical training. Supported by improved legislation and by-laws, NAPR succeeded to introduce simplified and fast methods of registration, removing for instance necessity of involvement of notaries in transaction registration, assigning a legal validity to non-sealed registration documents print-

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\(^{22}\) See: http://www.heritage.org/index/ranking, as of 28 January 2014.
\(^{23}\) See: http://www.doingbusiness.org/rankings, as of 28 January 2014.
ed out at any place from the openly available registration database, allowing application for property registration in authorized non-registration offices, e.g. banks, etc. As a result today property registration takes only 3 days (expedited services are also available) instead of almost 1.5 months in 2004, 2 procedures instead of 8, and costs less than 0.1% of property value instead of 2.5%. As a result, since 2011 Georgia’s property registration system has been rated as #1 in the world by the Doing Business survey (2013).

Interestingly, land administration is not the only sector where Georgia reached good results thanks to implementation of modern geoinformatics. For the same reason it made a huge progress in very sensitive for many countries field of construction permits. Today Georgia ranks 3rd worldwide just after Hong Kong and Singapore.

However, the race for best places in world rankings isn’t a primary goal and pick of achievements for Georgia in the field of governance and service provision. Since 2010 a new concept of ‘Public Service Hall’ or ‘House of Justice’ (as labeled in Georgian) became a driver of revolutionary reform. Public Service Halls operate under the Ministry of Justice and provide variety of public services that include the services provided by the Civil Service Development Agency, the National Archives, the National Bureau of Enforcement and the Notary Chamber of Georgia. NAPR is also a part of the Public Service Hall group and, consequently, the usage of spatial information during immovable property registration is an essential part of registration. Hence, the Public Service Hall has gone far then ‘one-stop-shop’ and introduced totally innovative service to the citizens – ‘everything in one space’. Currently, Public Service Hall endeavors to provide over 300 services at the main location in Tbilisi. Services are made available at public service halls in some other cities – Batumi, Rustavi, Kutaisi, Zugdidi, etc. – throughout the country.

The popularity of Public Service Halls is high among local citizens but it also admires many foreigners – visitors, experts and politicians – for its innovative approach to public services and serving an excellent case of good governance. The UK Parliamentary delegation, one of many official visitors of Public Service Halls, even launched a discussion in the Parliament on consideration of this ‘Georgian brand’ for improving public services in Britain, quoting the US Secretary of State Hillary Clinton’s words about “very creative and impressive advancements”, and “modern technological wonder”.24

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7. Endnotes: How to join the fast world?

In this chapter we tried to tell the story how the relatively small, politically shocked and economically weak post-Soviet transitional country of Georgia has transformed from almost frustrated state into the leading reformer in the region and beyond. It is difficult to judge to which extent modern geoinformation technologies have contributed to Georgia’s progress but a fact of their high importance is doubtless. Moreover, we argue that without an extensive implementation of innovative concepts and approaches using geoinformation most of the development would never be possible. Then a question arises: is all already done? The answer is negative; the above-mentioned progress shouldn’t be perceived as an absolute success, because there are still many shortcomings and deficiencies. The process of development is dynamic and ever demanding – it never ends and requires constant follow up and innovations, especially as geoinformation tools and methods are developing and changing very rapidly.

However, the main indicator of success and progress is not so much international rankings but socioeconomic welfare of the population which still lags in Georgia. Per capita income is insufficient, and levels of unemployment, poverty and vulnerability relatively high. This means, to our opinion, that the obvious progress in governance and information provision not yet is converted into socioeconomic gains for the entire population and this problem must be tackled in the coming years.

In order to achieve this objective, the following major problems must be overcome:

– Geoinformation should be equally accessible for all population groups and the tools of spatial data capture, processing and dissemination universally available.

– A great majority of citizens should be sufficiently aware about the importance of geoinformation, and should possess knowledge and skills to deal with. This requires high quality education and training of the population, especially of managers and decision makers.

– A geographical ‘capability gap’ in geoinformation usage between urban and rural population, especially citizens of the capital city of Tbilisi and the rest of the population, must be narrowed.

– A systematic follow up of geoinformational innovations and international networking in this field must be assured by the implementation of relevant official policies.

25 It is noteworthy that 20% of the territory of Georgia is occupied by Russian Federation after the Russian-Georgian war of 2008.
Chapter XII. Geoinformation and Development in Transitional Economies...

Although it is naïve to think that application of modern geoinformation technologies will solve all the problems of overall development alone but we believe that it definitely helps a progress in many ways. As Georgian case shows, involvement of advanced technologies doesn’t fully eliminate a gap between fast world and slow world; however, it makes this gap smaller. All the rest largely depends on good governance, of which the use of geoinformation is an essential part.
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“The reviewed book consists of 230 pages and contains 12 chapters written by various authors and forewords justifying the aim of the book and its target. The discussed issues concern legal aspects of geospatial information – its creation and making it accessible. Doubtlessly it is one of few non-serial publications discussing the matter of making geoinformation accessible and its re-use not only in Poland, but also in Germany, Switzerland, the Netherlands, Georgia, and Australia. The issues tackled by the authors of individual chapters are extremely important and topical when facing dynamically developing geoinformation market, creating geosocial networking, free data, and free and open software, as well as ever more frequent use of geographic information by the public administration, entrepreneurs, and citizens for aiding the decision-making process. [...] The reviewed publication presents legal aspects which concern using geospatial data and building the infrastructure for spatial information from the point of view of several countries, also from these outside the EU. In this aspect, it is an innovative work, at least on Polish soil. Many instances of judicial decisions about the re-use of geospatial information surely facilitate the understanding of the complexity of making spatial information available by the public administration bodies.”

Dr hab. Elżbieta Bielecka, Prof. WAT, Eng.
Faculty of Environmental Engineering and Land Surveying
Warsaw, 11th October 2013

“Due to the rapid development in computer science and information technology in recent years, we witness a dynamic development of various fields of knowledge. One of such fields of knowledge is spatial information, also known as geospatial information, geographic information or geoinformation. This phenomenon is closely dependent on the development of information technology of spatial information systems and global satnav systems. Geoinformation may be considered in its broad or narrow aspect as well. In its narrow aspect, geoinformation is understood as information obtained through the interpretation of geospatial data and of special properties. A trait of geoinformation which differentiates it from other types of information is the fact that one of its essential attributes are data determining location in relation to Earth expressed in a system of coordinates. In its broad aspect, this term is used to account for the field of knowledge concern-
Geoinformation – law and practice

...ing the broadly understood issues in spatial information. For last several years there has been plenty of publications on the topic of geoinformation. However they mostly concern geoinformation systems, while legal aspects are discussed infrequently and vaguely. The creation of the infrastructure for spatial information undoubtedly requires an in-depth analysis of legal aspects, especially these of the right to privacy and the protection of intellectual property. Thus, in my opinion the effort put in publishing a monograph on legal aspects of geoinformation, especially focusing on the legal situation in EU and other countries, deserves recognition and popularisation.”

Dr Małgorzata Gajos
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