Legal Framework for a European Union Spatial Data Infrastructure: Uncrossing the Wires

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ABSTRACT

The development of a spatial data infrastructure (SDI) not only comprises technical aspects but also is supported by economic, social, organizational, and legal measures. The legal framework for a European Union (EU) SDI consists of two kinds of information policies: those that promote and those that hinder the availability of spatial data. Three types of policies promote spatial data availability, each with a different purpose: access, reuse, and sharing. In the European legal framework, these types of policies correspond, respectively, to three major legal directives: the directive on environmental information, the directive on reuse of public sector information, and the INSPIRE initiative. Among the policies that hinder the availability of spatial data are those dealing with privacy, liability, and intellectual property. Intellectual property rights in particular endanger the availability of spatial data for access, reuse, and sharing and can pose a considerable threat to the development of the EU SDI. Many European public agencies use their intellectual property rights on spatial data to gain additional funding for their activities. We address the relationship between the three legislative initiatives and look at the influence of intellectual property rights on the availability of spatial data.

INTRODUCTION

The development of a spatial data infrastructure (SDI) not only comprises technical aspects but also is supported by economic, social, organizational, and legal measures. In many cases, these take more time and effort to establish than technical aspects, as the flexibility, inquisitiveness, and resilience of the human beings behind the technology are put to the test. Recently, more attention has been given to these human aspects of SDIs (Onsrud et al. 2004; Wehn De Montalvo 2003; Warnest et al. 2003), but numerous issues prevent SDIs from fully exploiting all their technical possibilities, with a large number of these issues being of a legal nature (e.g., access and commercialization, privacy, liability, security, etc.). In order to avoid the usual time gap between the emergence of new technologies and the development or adaptation of legislation to keep up with these technologies, the legal questions should be treated alongside the technical, economic, and organizational matters and not as an afterthought.

In this article we look at the legal framework for the availability of spatial data in a European Union (EU) SDI. The centerpiece of this framework is the INSPIRE (Infrastructure for Spatial Information in Europe) initiative of the European Community (Commission of the European Communities 2004), which was approved at the beginning of 2007. INSPIRE, however, is surrounded by other existing policies on the availability of information, which may be complementary to it or may cause conflicts. These policies can be divided into two categories.

On the one hand, certain information policies make spatial information, as part of a wide range of information (e.g., public sector information or environmental information), available to interested parties. These interested parties can be the public sector, the citizens, or companies. In the European Community, the most important rules are laid down in the 2004 Directive on Re-use of Public Sector Information (PSI directive) and the 2004 Directive on Public Access to Environmental Information. The PSI directive, the directive on environmental information, and INSPIRE each have their own purpose and target group, but they all aim to increase the availability and dissemination of spatial data.

On the other hand, the EU SDI is also regulated by legislation that can impede the availability of spatial information. These stem from concerns about privacy, intellectual property ownership, security, and liability (figure 1). The fact that most of the spatial data is held by the public sector also has an impact on these restrictions.

Facilitating spatial data sharing by reconciling these competing policies is an enormous challenge (Onsrud et al. 2004). Moreover, the conflicting legal policies are underpinned by questions concerning the relationship between the public and private sectors in the provision of spatial data and services and the role of public agencies in the information society and on the information market. Public agencies are in many cases the sole or the most important producers of specific spatial datasets, which in the language of competition law translates into a dominant position or a monopoly. Depending on their activities, they may be subject to European Union or national competition rules.

We focus on the elements of these information policies that currently are most discussed and that need to be addressed urgently to create a solid and well-functioning EU SDI. We will address the relationship between the three legislative initiatives that promote availability of spatial information and attempt to delineate their scopes. We will also look at the influence of intellectual property

rights on the availability of spatial data and point out the need for clear references to the appropriate legal frameworks in any SDI discussion.

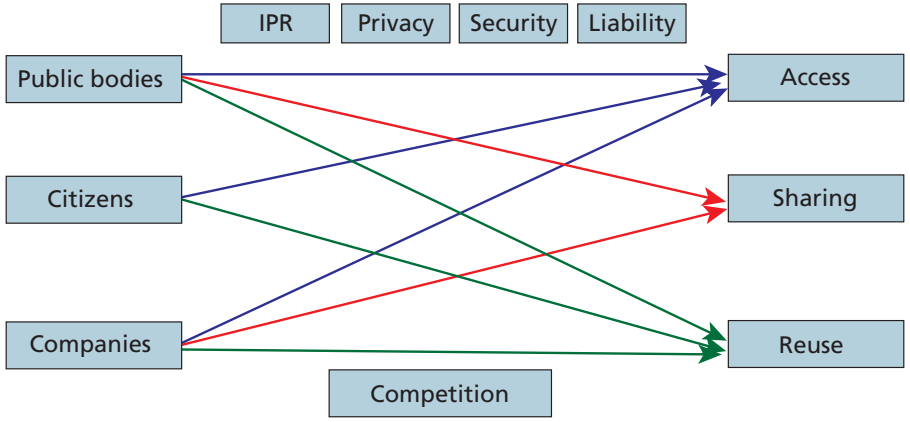

Figure 1. Information policies affecting the EU SDI.

INFORMATION POLICIES PROMOTING THE AVAILABILITY OF SPATIAL DATA

Spatial data are used by public agencies, the commercial sector, scientific researchers, community interest groups, and individual citizens for wide-ranging purposes (Onsrud et al. 2004). Depending on the type of user, but mostly on the purpose for which the spatial data is used, the process of obtaining data is addressed by different information policies. The scopes of the three European directives overlap to a considerable extent. The PSI directive applies to all public sector documents, the directive on environmental information addresses environmental information, and INSPIRE deals with spatial data. As shown in figure 2, a significant proportion of spatial data relates to the environment and is created or collected by the public sector. We will focus on this subset of data.

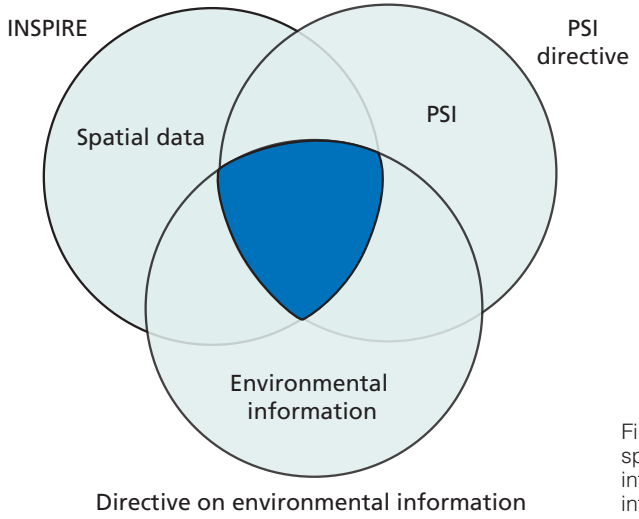

Figure 2. Relationship between spatial data, public sector information, and environmental information.

For each type of data, another distinction can be made between access, sharing, and reuse, based on the type of use. Thus, for our data subset, if a natural or legal person intends to obtain a document or information in order to exercise his democratic rights or obligations, we refer to this as access. Hence, access mainly involves democratic or political purposes and is generally outlined in freedom of information legislation and, in particular, in the directive on environmental information and the corresponding implementation legislation in the EU member states. INSPIRE also contains a number of elements that relate to access.

The second type of use policy is reuse. Our concept of reuse is based on the definition in the PSI directive: use for commercial or noncommercial purposes outside of the public task. We propose that the difference between access and reuse, in terms of purpose, could be described as follows. Reuse entails data processing beyond mere access to the document in order to learn its content. For example, researchers need to perform analyses on the data, in many cases combining it with other data. Merely accessing the data will not be enough. Academics and nonprofit organizations being the exception, reuse often has an economic goal. Mostly, it entails the creation of commercial products and services, often combining spatial data with other data layers, such as navigation systems, weather services, real estate services, and so on. However, it could also refer to the use of spatial data by the private sector for determining business strategies such as determining locations for new company branches by analyzing spatial data in combination with consumer statistics, environmental regulations, public transport arrangements, and so forth. No new products or services are created, but the data undergoes some form of processing, for purposes beyond the "checking up" on the government.

The third type of use policy, data sharing, refers to delivering or obtaining spatial data for the purpose of performing a public task. Generally, sharing involves the exchange of data between public agencies. However, if private companies are entrusted with the provision of a public service, some of their dissemination or acquisition of data may also fall under data sharing.

If we define the terms of access, reuse, and sharing based on the purpose of the use (and not on the type of user), the different users of spatial data, who can roughly be divided into public bodies, citizens, and companies, may all have access to, reuse, or share spatial data, depending on the goals of their activities (figure 3). For instance, a public body that disseminates or receives public spatial data for the purpose of performing a public task is sharing data. If it uses acquired public spatial data for creating and selling an information service on the market, this constitutes reuse. When a company requests data on, for example, environmental permits or cadastral units to find a new location for its headquarters or to create a service offered to other companies or the wider public, this also constitutes reuse, while asking for copies of the permits to check whether the government followed the rules falls under access.

The distinction between these three types of use of spatial data in the EU SDI should help determine with which information policies and regulations one must comply. In the European Union, access to environmental spatial data is covered by the directive on environmental information (which lays down the principles of the Aarhus Convention [UNECE 1998]) and chapter IV of the INSPIRE directive.

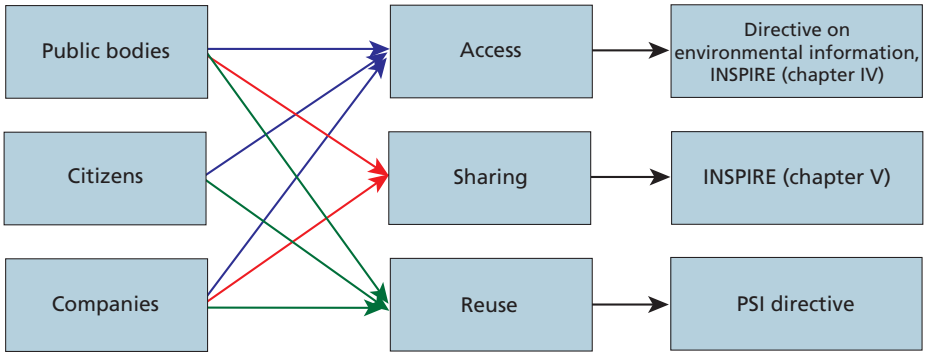

Figure 3. Types of use and corresponding legal directives.

Chapter V of the INSPIRE directive deals with the sharing of spatial data between public agencies. Reuse of public spatial data is addressed by the PSI directive.

As conditions and rules differ between these directives, a user must determine under which legal policy he has to formulate his request and which conditions he will have to comply with. In an ideal world, the distinction would be clear-cut, and no overlaps would exist. However, the ideal is already somewhat shattered by INSPIRE, which also contains some stipulations on access.

INSPIRE. INSPIRE lays down general rules for an EU SDI for performing public tasks that have an impact on the environment. It focuses on data sharing but also provides for public access to spatial data and spatial services. For now, INSPIRE addresses only the environmental sector, but it can be extended in the future to other policy domains, such as agriculture, transport, and energy. The directive specifies obligations for the EU member states and the public agencies on metadata, interoperability, network services, data sharing, monitoring, and reporting.

The basic principles of INSPIRE are as follows (INSPIRE DPLI Working Group 2002):

- Data should be collected once and maintained at the level where this can be done most effectively.
- It must be possible to seamlessly combine spatial information from different sources across Europe and share it between many users and applications.
- It must be possible for information collected at one level to be shared between all the different levels (detailed investigations, general strategic purposes, etc.).
- Geographic information needed for good governance at all levels should be abundant and widely available under conditions that do not restrain its extensive use.
- It must be easy to discover which geographic information is available, fits the needs for a particular use, and under what conditions it can be acquired and used.
- Geographic data must become easy to understand and interpret because it can be visualized within the appropriate context and selected in a user-friendly way.

PSI directive. The commercial value of spatial data did not escape the attention of public agencies. In many of the EU member states, public agencies are well aware that they can make money by offering their spatial data to the public at cost recovery or market prices. Many of them consider the sale of their data a necessary supplement to their government funding, even though opponents of this policy have argued that data that was already paid for by tax money should not be sold back to taxpayers at cost recovery or market prices. Some have argued that making public data available at lower prices or free of charge would actually create more income for the state, because of the expanded use of the data and the resulting increases in tax revenue (Pluijmers 2002; Weiss 2002; PIRA 2000).

Some public agencies not only sell their raw data but also create their own commercial products based on those data. In doing this, they become not only the suppliers of the private sector but also its competitors. This could create tension between the public and private sectors, as a public agency that sells commercial products and services will not be eager to pass on its data resources to competing providers. Since public agencies often have a monopoly, or at least a dominant market position, distortion of competition becomes a genuine risk. Temptation will be great for the public agency to sell at high prices to the competition or to eliminate the competition by charging very low prices to the consumers for the end products.

For these reasons, the European Commission felt that the different views and practices on making PSI available to the private sector impeded the development of the European information industry. Envious eyes were cast on the American information market, which was thought to benefit from easy and cheap availability of PSI, at least on the federal level (Commission of the European Communities 1998, 2001). Harmonization of the legislations of the EU member states should contribute to the development of the European market and information society. A European directive was voted for, creating a framework for the reuse of PSI, with spatial data being one of the most important categories.

The PSI directive lays down a set of minimum rules for public agencies to make their data available to the private sector. Member states are not obligated to disseminate data for reuse but are encouraged to do so under specified conditions. These conditions include time limits, available formats, fees, and transparency. The directive also makes sure that public agencies comply with the rules of fair competition. If a public body creates value-added products or services on the basis of its own documents for commercial activities outside the scope of its public tasks, the same charges and conditions should apply to the supply of the documents as those for other users. Otherwise, the activities of the public agency would lead to a distortion of market competition.

Directive on environmental information. The directive on environmental information aims to guarantee the right of access to environmental information held by or for public agencies and to ensure that environmental information is progressively made available to the public. The involvement of the European Community was an exception to its usual position that access issues should remain the sole competence of the EU member states. The Community considered the issue as too closely related to environmental matters, for which it does have competence.

The directive ensures free-of-charge on-site viewing of environmental information while allowing public agencies to charge a reasonable fee for supplying the information. As a general rule, the charges may not exceed the actual costs of production. However, when a public agency makes its environmental data available commercially in order to guarantee continued collection and publication of such information, market rate charges are allowed. This stipulation is intended to satisfy the concerns of public agencies regarding their income and regarding possible abuse of the received data by the citizen. However, market prices limit citizens' opportunities to stay informed about the activities of the government, in favor of providing the public agencies with the necessary resources for their activities.

As a side note, we can also mention a typical problem that legal policies encounter when they are confronted with new technologies. Any legal framework for an SDI should avoid technology dependency and use terminology that can be interpreted in the light of future developments. The directive on environmental information failed to do that, even though it is only a few years old. It distinguishes between making information available for on-site consultation and the supplying of information. How do we categorize viewing services on the Internet: as consultation or supplying? Making a document available for consultation allows the user to learn its content but not to retain a copy, while supplying a document provides the user with his own copy which he can consult afterwards. From a purely technical standpoint, viewing an Internet page leaves a cache copy on the hard drive, even if it is only temporary. However, a more teleological and perhaps common-sense interpretation of consultation—where the difference between on-site and remote consultations is outmoded (as it is merely a matter of physical presence)—would make remote viewing services a form of consultation (Janssen 2005). This openness to interpretation illustrates the importance of formulating legal measures as much as possible in a technology-neutral manner.

Relationship between the three directives. The three directives specify conditions for the availability of information. For instance, charges for access to information should, as a rule, not exceed the cost of production, charges for reuse can include a reasonable return on investment, and charges for sharing have to be kept to the minimum required to ensure the necessary quality and supply of spatial datasets and services together with a reasonable return on investment, while respecting the self-financing requirements of public authorities supplying spatial datasets and services. Public research institutions have to provide access to environmental information, but they do not fall under the scope of the PSI directive. The PSI directive includes transparency requirements for reuse (such as clearly specified conditions and charges), while the INSPIRE directive does not contain any transparency requirements.

The distinction between the legal policies for access, sharing, and reuse should be clear (figure 3). However, some incongruities will always remain, due to situations or requests for data the purpose of which may be hard define. For instance, in the example mentioned above, if a company CEO requests information on the building permits for a piece of land, is he intending to exercise his democratic rights as a citizen to know whether the public agency in question followed the rules in awarding the permit, or is he acting for his company and planning to use the information to determine the location of the next office branch?

Even a clear purpose does not guarantee the use of the proper procedure, however. Misuse or abuse is always possible, and public agencies cannot check up on how their data end up being used. Often the type and quantity of the requested data will be a first indication of the plans of the applicant but not always. The apprehension for this kind of abuse has led public agencies to take precautionary measures. Some of these are understandable, such as the INSPIRE idea to make spatial data available in a form that would prevent reuse for commercial purposes. Measures like these do not limit access or sharing, so they are not harmful to the SDI. However, if the concern for possible abuse leads public agencies to limit access and sharing or charge high prices, the development of an EU SDI is in danger. On the one hand, rules and procedures should be as harmonized as possible for all uses; on the other hand, public agencies should not use the possibility of abuse as an excuse to limit the availability of spatial data more than necessary.

INFORMATION POLICIES LIMITING THE AVAILABILITY OF SPATIAL DATA

Several legal policies limit the dissemination of spatial data. The privacy of the individual and the security of the nation have to be protected against the publication of certain data, and liability considerations lead public agencies to very strictly control what happens with their data. These limitations seem to be a lot less contested, however, than the restrictions stemming from intellectual property rights (IPR), a subject that has been debated extensively in the development of INSPIRE.

IPR. The goal of IPR is to stimulate innovation and the dissemination of information by rewarding authors who create original works for their effort and enabling them to control the use of their work by others (Laddie et al. 2000). In general, IPR require some level of originality (e.g., creativity for copyright, novelty for patents). However, with the advent of information technology and computer-generated works, the traditional level of originality has become harder to reach. This includes spatial data and databases. Spatial data constitute a factual representation of reality, and their value lies in their accuracy and interoperability with other data; spatial databases are valued mostly for completeness, user-friendliness, and interoperability. These elements limit the level of originality and the eligibility of data and databases for copyright protection. Yet the considerable investments required for the creation and collection of data and the ease with which the data can be copied increase the risk of misappropriation.

This is one of the reasons that the role of IPR has increasingly been shifting from the promotion of innovation in science and art towards the protection of the financial interests of the rightholders. IPR are being used as a tool against misappropriation, to protect effort and investment. For instance, a 1996 European Union directive on the legal protection of databases protects a database if its maker shows that there has been a substantial investment in either the obtaining, verification, or presentation of the contents to prevent extraction or reutilization of the whole or a substantial part of the database. This so-called *sui generis* right has been subject to criticism (Hugenholtz 1998; Maurer et al. 2001; David 2000) and has been curtailed by a number of judgments of the European Court of Justice in 2004 (European Court of Justice 2004). The Court made it clear that the resources used in the "creation" of the data did not count toward a substantial investment in the database and that only the resources used for obtaining

preexisting data in order to assemble the database were relevant. The impact of the Court's decision may be considerable and should be examined. In addition, as the database right only protects nonsubstantial parts of a database from copying only if such copying conflicts with the normal exploitation of the database or unreasonably prejudices the legitimate interests of the database, the protection may not be as strong as is often assumed.

IPR of public agencies. The question of whether data are protected by IPR might also be influenced by whether they are held by the public sector. The Berne Convention (article 2.4), the most important international treaty on copyright, states that member states can themselves grant protection to official texts of a legislative, administrative, or legal nature and to official translations of such texts. It does not contain any definition of "official text," nor does it refer to any other documents of the public sector, such as reports, brochures, databases, and so on. These works can all be protected by copyright if they fulfill the conditions of originality and expression. Many national copyright acts exclude official texts from copyright protection but do not exclude other government works, such as reports, brochures, audiovisual material, etc. Notable exceptions are the United States and Austria, which exclude all works that are made public for "official use." The *sui generis* database right is not excluded for public agencies in any EU member state. In some countries, of which the most obvious example is the United Kingdom, IPR are used extensively as a source of funding for government agencies which have to finance the updating or expansion of their original government-funded datasets themselves.

IPR on spatial data. Because misappropriation risks and funding limitations worry public sector data producers and can potentially hinder the availability of information, IPR have been one of the major points of discussion in the development of an EU SDI and in the elaboration of the information policies mentioned above. Under the directive on environmental information, EU member states may refuse public access to data on the basis of IPR, and limiting public access on the basis of IPR has been one of the major debates in the development of INSPIRE. The European Commission and Parliament agreed that the IPR of public agencies should not limit public access to INSPIRE services (Commission 2004; European Parliament 2005, 2006), while the Council voted to allow EU member states to prevent public access to spatial data on the basis of IPR (Council of Ministers 2006). The final version of the directive holds only a small concession to Parliament: public access to discovery services cannot be restricted on the basis of IPR, but the other services can.

One of the Council's reasons for including IPR was to make the INSPIRE directive consistent with the directive on environmental information, which contains the same list of exceptions. Of course, consistency should be applauded, but it should not be the main reason for limiting public access to information. Moreover, the reasons for including this limitation in the directive on environmental information do not seem sufficient to justify this restriction of access. Public agencies may perceive a threat for two reasons: (1) access to spatial data may be misused to circumvent the rules and charges for reuse, and (2) potential revenue from selling data products or services may be lost. Both concerns can be allayed without denying access to spatial data. Other safeguards against misuses, such as the use of digital rights management (DRM), can be implemented.

Despite its bad reputation, stemming from its sometimes overenthusiastic application in the music industry, DRM may be of considerable value for the spatial data environment. DRM not only is a means of restricting the availability of information, but it can also be used for the electronic management and marketing of digital content (INDICARE 2004). If DRM is used to manage and track the use of spatial data, and to ensure compliance with use conditions, limiting access would be an excessive restriction of the public's right to obtain information from government. In addition, keeping in mind the public agencies' need for resources, limiting the access of the public out of concern for misuse may be counterproductive. What is not available obviously cannot be charged for, and anyone who is interested in actually buying the data will want to see if the data fits his purpose first. Thus, limiting public access to spatial data not only needlessly restricts the public's right to information but also goes against the public agencies' own interests.

Interestingly enough, the PSI directive's restrictions on reuse based on IPR seem to be less far-reaching than the INSPIRE directive. The PSI directive excludes only documents for which third parties hold IPR. In addition, the recitals of the directive encourage EU member states to exercise their copyright in a way that facilitates reuse. Thus, IPR limitations on reuse of public sector spatial data may be lower for commercial reusers than for citizens and for public agencies performing their public tasks.

Charges for spatial data. Charges for spatial data are closely linked to IPR and were debated at length during the formulation of the PSI directive. Should data that is collected at the expense of the taxpayer be freely available to the private sector, or should the burden on all the taxpayers be reduced by making the few parties that reuse the information pay for the expenses they cause? As mentioned above, some have claimed that making information available free of charge (or at the cost of dissemination) would lead to more income for governments because of the higher tax revenues, while others point to the necessity of public agencies to be self-sufficient and try to put cost recovery policies into perspective (Pluijmers 2002; Weiss 2002; PIRA 2000; Longhorn and Blakemore 2004). In the end, a very broad margin was given to the EU member states, allowing them to charge anywhere from no fee at all to an amount equivalent to the combined costs of collection, production, reproduction, and dissemination, plus a reasonable return on investment (article 6 of the PSI directive). The margin is somewhat understandable. After all, why should public agencies risk losing resources in giving away their information for free when the information industry intends to make a profit from reusing it?

More problematic, however, is charging for access to spatial data and for data sharing. The directive on environmental information makes it possible for public agencies to charge for the supply of information. The charges should be reasonable, as a general rule not exceeding actual costs of producing the material in question, except when a public agency makes the information available on a commercial basis, and this is necessary to guarantee the continuation of the collection and publication of such information. In that case a market-based charge is also possible. For INSPIRE, charging for spatial data was the most contested issue after IPR, both for access of the public to network services and for the sharing of spatial data between public agencies. Once again,

the Council had a more restrictive view than the Commission and the European Parliament, wanting to charge the public not only for downloading but also for viewing data, if the charges would be essential to the maintenance of the datasets and services (Council 2006). The Commission and the Parliament wanted to keep access of the citizen to viewing services free of charge (Commission 2004; Parliament 2005, 2006). In addition, the Council wanted public agencies to be able to use licenses and require payment for sharing data with other public agencies, while the Parliament wanted those payments to not exceed the cost of collection, production, reproduction, and dissemination. Not including such a limit would have the bizarre effect that charges for reuse by the information industry would be limited to a reasonable return on investment, while prices for data sharing would not be restricted at all. This of course does not automatically mean that sharing spatial data would cost more than reusing it, but the possibility would exist. The final version reached a compromise: public access to viewing services should not be charged for, unless such charges secure the maintenance of spatial datasets and corresponding data services, and charges for data sharing should be kept to the minimum required to ensure the necessary quality and supply of spatial datasets and services, together with a reasonable return on investment, while respecting the self-financing requirements of public authorities supplying spatial datasets and services.

The Council's point of view on charging was influenced by a number of public agencies that are very large data producers and users, such as national mapping agencies and meteorological agencies. They feared that opening up their spatial databases to the entire European Union would create untenable pressure on their budgets, preventing them from maintaining data quality and breadth. Hence, one of the biggest complaints about INSPIRE is the current lack of knowledge of the exact costs and benefits of an EU SDI and whether the SDI might be sustainable under the model that the Commission and the Parliament proposed (Longhorn and Blakemore 2005). The same question was raised during the drafting of the PSI directive and has remained unanswered. Without a clearer view of the sustainability of the EU SDI as a whole, and not only the financial viability of existing data producers, deciding on the proper legal framework might be very difficult, especially in light of the fact that spatial data are very low on the political agenda and funding from the central government treasury is unlikely.

CONCLUSIONS

The legal framework for the EU SDI consists of two types of information policies: policies that stimulate the availability of spatial data and policies that hinder it. To "uncross the wires" between these different policies, a clear view of what part of the SDI is being addressed is crucial: access, reuse, or sharing of spatial data? Not merely a matter of terminology, this distinction also determines what legal framework is applicable and what consequences this has for the users and suppliers of the spatial data. Any discussion of access should not involve the PSI directive, while debates on the INSPIRE directive have nothing to do with the information industry creating added-value products based on spatial data held by the public sector. Mixing the terms and the issues creates confusion and needlessly hinders the development of the SDI by creating unrealistic expectations and

demands on the public agencies. In addition, over- or underestimating the impact of information policies that limit the availability of spatial data may also lead to unwanted complications. For example, the extent to which spatial data and databases are protected by IPR and the extent to which IPR will influence the availability of spatial data are not entirely clear. Until these matters are sorted out, discussions between policy makers will be filled with uncertainty and knee-jerk reactions to perceived threats.

Ideally, all these information policies would fit seamlessly together, or even be harmonized into one framework, where sharing, reuse, and access would all have to comply with the same rules and IPR would be used to ensure a perfect balance between maximum availability of spatial data and the sustainability of the SDI. This would also eliminate the need to define the scope of the public task, which distinguishes reuse and sharing and depends on ever-changing political views. Because a harmonized framework may prove to be impossible, or in any case unrealistic in the very near future, we should look for the largest common denominator between the legal directives for access, reuse, and sharing and devise a framework where the first layer contains the common conditions for access, sharing, and reuse and additional layers or terms of use can be added according to the purpose for which the spatial data are required. Finding this legal common denominator is essential for an efficient and effective EU SDI.

ADDENDUM

After the manuscript was accepted for publication, a compromise was reached on INSPIRE and the directive became effective on 15 May 2007. The full text of INSPIRE is posted at http://www.ec-gis.org/inspire/directive/l_10820070425en00010014.pdf.

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