Legal Issues Regarding Spatial Data

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Key words: Spatial (Geographic) Data, Property rights, Privacy Protection and Liability.

ABSTRACT

This paper presents the general legal provenance, regulatory development and its implementation in the field of GIS technology in Slovenia. The copyright security, privacy protection and liability issues regarding the spatial (geographic) data sets in general are outlined. Further on protection of spatial databases and quality assurance for spatial data in the country of economical, social and political transition are discussed. The outlined problems are presented in the light of legal provision and its practical acceptance for public services and private enterprises. The main stress is addressed on the spatial data sets that are produced and maintained by the geodetic service and the surveying branch, which are kept in the large official databases covering the whole country.

ZUSAMMENFASSUNG

Dieses Referat behandelt die allgemeine rechtliche Provenienz sowie die Entwicklung der gesetzlichen Bestimmungen und deren Anwendung im Bereich der GIS-Technologie in Slowenien. Umrissen werden die Sicherheit der Urheberrechte, der Schutz der Privatsphäre und die Fragen der Haftung betreffend die (geographischen) Raumdaten im allgemeinen. Des weiteren wird der Schutz der Raumdaten-Basen und die Sicherung der Qualität für die Raumdaten in einem politischen, socialen und wirtschaftlichen Reformland behandelt. Die angezeigten Probleme werden aus der Sicht der gesetzlichen Bestimmungen und ihrer Akzeptanz für den öffentlichen Sektor und die privaten Unternehmen in der Praxis dargelegt. Die Hauptbetonung liegt auf den Raumdaten, die von Vermessungsämtern und der Vermessungsbranche geschaffen und in großen amtlichen nationalen Datenbasen aufgehoben werden.

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1. INTRODUCTION

The main legal issues regarding the spatial (*geographic*) data, information and GIS technology supported databases in general are related to the three prevailing problem domains:

- Intellectual Property Rights and GIS technology - copyright issues on spatial data sets, topographic and thematic maps, GIS databases, GIS software and applications etc.,
- Privacy Protection and GIS technology - confidentiality protection in GIS databases versus enabling public access to spatial data, personal integrity data and political sensitive data, policy for restrictive disposal and limited access to spatial data etc.,
- Liability and GIS technology - warranty and (*legal*) responsibility for specified spatial data quality, liability contract problems, negligence, torts and damages, limited recovery strategies for spatial data etc.

The outlined legal problems related to the GIS technology in Slovenia are described from two different aspects. The first approach deals mainly with the internal aspects of the related legislation. The short overview of laws and additional regulations that are implied for public and private sector is presented. The establishment of control over spatial data gathering, maintenance, disposal and usage was the principal objective. It took almost a decade to develop and set up the appropriate legal system. The first versions of laws tended to be rigid and therefore were hampering their practical application. The next versions or amendments to certain laws have reinstated the appropriate, contemporary and less severe legal settings.

The second aspect addresses more practical and immediate approach, dealing with GIS technology application concerning large statewide databases and describing necessary relations to legal issues. The stress is more on the firsthand problems with spatial data and thus the user-based or outside approach is presumed. The importance of legal regulations related to the protection of data about individuals is the main focus. The awareness of the disposable legal means, such as insight into databases, appeal, complaint and corrections is crucial starting point for privacy protection.

2. COPYRIGHTS

GIS technology and massive open use of spatial data can create many benefits to each society. Progress in this field also brings many actual and possible threats. Rapid technological progress in the field of telecommunications, networking, new media and information dissemination is forcing copyrights legislation and data protection to confront many new challenges. Consequently it is necessary to protect authors of spatial data with respect to their pertaining moral and material rights that derive from their intellectual creation. Therefore, it is necessary to establish appropriate conditions for lawful usage and exploitation of intellec-

tual works in the field of GIS technology and large spatial databases.

In the developed countries the share of information economy increases and constitutes more and more significant part in the overall gross domestic product. The precondition for restoration and effective operation of wide market with spatial data is well-harmonized legislation (Frank, 2001). Copyright law protects the producer or owner of spatial data against misuse and as well enables them to attain the proper price for their established datasets. Owners of spatial datasets are first of all concerned about the effective protection against abuse of licenses and illicit distribution of digital data.

The data buyers seek for minimal restrictions and law prices, which in the future should generally form according to the market value of spatial data and the provided services, and as well reasonable acquisition costs and duties. The public interest supports massive application and multiple reuse of spatial data, which as an infrastructure directly promotes the national economy, and therefore mediately increase social welfare. It its thus difficult to achieve the appropriate formal compromise and balancing of interests that can suit all the concerning parties and to certain extent also to settle the conflicting claims.

2.1 Law on Copyrights and Other Similar Rights

With the Law on copyrights and other similar rights (1995) and its amendments (2001) Slovenia conformed its legislation to the common EU (European Union) solutions and as well to the international orientation regarding the protection of intellectual property. Legally the author is a physical person, who creates an intellectual work. Copyright is an integral right over the intellectual work and is considered as one of the basic human rights. Copyright is divided into moral and material rights and also some other rights.

Material rights of authors preserve their property interests by enabling them to allow or to disallow usage of their works, and as well to assert them suitable conditions for their reimbursement. Moral right protects authors regarding their personal ties to the intellectual work. Moral rights are exclusive rights of authors that their names or other denotation are stated in the case of publication or performance. All copyrights remain even after the expiration of their authors at least to the termination of their financial rights. Moral rights are preserved and only the authorized rightful claimants can further assert the material rights.

According to the Slovenian Law on copyrights and other similar rights (1995, article 5) the following selected list of intellectual works, which are used in geodetic and surveying branches, can be broadly considered as related to spatial data and GIS technology products:

- Written works, such as articles, manuals, studies and computer programs,
- Photographic works, images and works produced according to the similar techniques,
- Sketches, maps, plans and realization projects in the field of urban and rural planning,
- Cartographic works,
- Technical presentations (technical drawings, plans, sketch, experts' reports etc.).

3. LEGAL PROTECTION OF COMPUTER PROGRAMS AND DATABASES

Legal protection of computer programs and databases is especially important, if we consider the financial and other resources that are invested for their development and maintenance. Software development and database construction namely involves substantial financial investments, technical equipment and human skills. Protection of such outfit is thus very important for software and database producers and indirectly also for the steadiness of their users. Unauthorized use of software or access to database resources, whole or partial copying of its contents, has noxious economic and legal consequences for all the involved actors.

3.1 Software

Computer programs are intellectual works and thus must be copyrights protected. In short and long term software piracy affects its authors (programmers), distributors and as well end-users (prices, concurrency, development, maintenance, support and market stability etc.).

- Authors are affected, because their intellectual work is diminished and therefore such creativity is demotivated.
- Producers are confronted with losses due to the unrewarded substantial investments into the software development process.
- End users have to deal with higher prices of licensed products and also cannot expect adequate support.
- Economies gather lower revenues and also collect fewer taxes.
- Also evident is an increased lack of business opportunities for small and flexible firms.

Even before the Law on copyrights and other similar rights (1995) and the later amendments (2001), which explicitly define software within the written works, computer programs were formally already protected according to the common Yugoslav copyrights legislation (1986), but regulations had variable effects in practice. In Slovenia the systematic and consistent protection of computer programs is enforced since 1995. Software use and reproduction is allowed only with accordance to the license or written permission. Violation causes civil sanctions and also indicates criminal act. The amendment from 2001 modernizes software protection in general and also expands protection to multimedia, networking and Internet domains.

3.2 Databases

Also in Slovenia one of the main precondition for the growth of information economy and spatial data trading is appropriate and integral legislation on database protection. The Law on copyrights (1995) does not yet formally mention databases. The amendments from 2001 explicitly introduce consistent database safeguarding, which is generally based on the EU guidelines for database protection (1996), and has realization paradigm in the similar British law from 1998. Similar legislation is also implemented in the majority of EU member states.

The new amendment (2001) contains several articles, which formally refer to database protection. This database section starts with legal terminology, which redefines basic terms, such as database, database owner and creator, database copyrights, rightful claims etc. Further on the object of legal protection is determined, which can be the whole or only a part of a database. The rights and obligations of owner, creator and users are also specified in appropriate detail. The last articles in database section define the continuity of copyrights and deal with conditions for their renewal or conveyance.

A database legally means a collection of specially arranged datasets, rules or other documents that are formed, gathered, maintained and accessible by electronic media. For copyrights protection database must be an authentic creation, or authors of a compiled database should have demonstrated reasonable knowledge and expertise in arranging its structure and contents. The derived database must not only be a replication or a copy of an existing one. Database is therefore defined as a collection of independent technical components, data and services that are:

- Systematically arranged (knowledge) and methodologically maintained (skills),
- And can be accessed through electronic (digital) media and other modes.

A database (whole or its parts) can be copyright protected, if as such it represents intellectual work. Such an orientation may include also secondary (derived) databases, which are just compiled from some existing ones. Other resources that are essential for database operations, such as database dictionary, indexes, on-line manuals and help etc., can also be included. Database software (DBMS) and applications are protected separately as computer programs.

The owner of a database is a physical or legal person that is basically considered also as its former. The author of database is a physical person, who constructs database, defines its structure, tests it, collects data and maintains the system. At the same time we can generally assume that author is also the investor of such development project. Investment in this context includes financial and technical means, labor, expertise and skills. If many persons participate in database development, then they are all considered its authors in ideal share, if there is no other explicit determination or contract. If an employee in a company or public organization elaborates a database as a part of his regular task or duties, then his company is considered as the database owner, if there is no other formal contract.

The database owner can freely dispose with it, what means that he can license or contract the conditions for its usage. Owner can as well prevent access or any form of database use to unauthorized users. Database usage can also represent its excerpts or publication of its selected contents. An abstract from database forms a temporal or permanent transfer of part of its content to other media with intention to publish, to mediate or to rewrite it. An open publication of whole or a part of database by any means in fact represents public access to its contents. Database ownership holds for fifteen years since its construction or public presentation, but can also be prolonged in the case of substantial modifications or renewal of its contents.

4. PRIVACY PROTECTION

People appreciate privacy and they believe that it is important and one of the basic human rights. Individuals have right to certain level of autonomy, and thus as well the right to get insight into databases with personal data, which collect and maintain various public organizations. The privacy protection law in Slovenia (1999) prevents the incompetent and illegal interference into the privacy of individuals, when such databases are gathered, maintained, used or transmitted. On the other hand the legal specification of individual rights to privacy or privacy itself are hard to define. Despite difficulties with the formal definition of privacy there is a common belief that it is rather straight to recognize various cases, when privacy is infringed.

Privacy is needed for the social and political freedom of individuals, their personal progress, sound inter-human relations and common intellectual health. Any democratic society must support such moral autonomy of its citizens in a manner that they have possibilities, volition and freedom for qualitative and autonomous decision-making. Private data protection thus comprises principles, rights and measures by which illegal interference with integrity of individuals, their personal or family life are precluded. Such menace evidently can originate from the systematic processing, maintenance and transmission of digital data about individuals, which are collected due to the increasing use of private data in modern societies.

Democratic society confronts the rights of individuals and the public interest of state, which for its functioning has to encroach the privacy rights of its citizens. Any state for its normal activities, such as army, law enforcement, public, social and taxation services etc., needs certain specific personal data about its citizens, and therefore it collects and maintains them. The protection of business, private and politically sensitive data one can also consider as national interest, and therefore such data have to be legally and technically safeguarded.

For usage of personal data in public or particularly in private sector one must obtain an official permit, which is the main legal measure and security mechanism for protection of privacy. Individuals have right to inspect their personal data, to be informed about their usage, and also right to appeal in the case of faults. Geocoded data, which refer to ownership of citizens and their real properties, must also be consistently regulated by such common legal measures of personal protection.

In the age of rapid development of database technology, networks and communications interesting are those data categories, for which individuals consider that they represent threat to their privacy. Similar analog data collections had been available for decades, but yet their digitalization and distribution endangered the privacy. The main reasons are thus increased accessibility to data, various cross-matching and data analyses, data interlinking and dissemination, what is all provided by intensive networking, relational databases and their identifiers.

4.1 Law on Protection of Private Data

The most of European countries have special laws that formally regulate, supervise and restrict the use of personal data. In Slovenia this is the Law on protection of private data (1991), which is already in its second release (1999). The first release of this law from 1991

was in principle to rigid for practical application and thus the personal data protection could not be carried out consistently. The newer law (1999), which was modernized, has abolished some rigidness and as well has introduced certain limitations for the rights of individuals. In certain special cases common interests can partly supersede the rights of individuals.

5. LIABILITY

Reliability norms and liability for quality of spatial data and quality of spatial data manipulating services are not expressly mentioned in the existing legislation. The guarantee of spatial data quality thus legally and partly technically remains an open issue in Slovenia, or in practice the similar approach as for software liability is applied. The adopted strategy of spatial data producers or owners in general is to evade warranty issues. This approach causes that the legal and material responsibility for the usage of spatial datasets relies on their users, who select, obtain and make use of datasets at their own choice and chance.

The official supplier of spatial dataset generally does not provide any specific formal guarantee of its specified quality. Therefore supplier does not assume legal responsibility in the cases of detriment, which can arise to the users while using inaccurate, inconsistent, incomplete or out of date datasets. Such specifications of reliability and provision of agreed quality level of spatial datasets can only be obligations that are expressed in a special contract.

6. DATA ON REAL ESTATES

Real estates cadastral systems comprise data on location, technical and topographic characteristics, ownership and land use of real property, and thus mediately also information on value or possible revenue. Cadastral data have noticeable technical, legal, social and also political significance. Cadastral data have also significant economic impact primary because of their value. They also represent important real property potential as an economic factor. According to the principle of publicity or transparency cadastral data should be in an appropriate form accessible to their legitimate users. The responsible organizations that maintain cadastral data thus have to provide and assure reliable and accurate data on real estates. Cadastral databases nowadays are also copyright protected, contain personal data, and the responsible organizations generally do not support liability issues or provide guarantee regarding the specified quality of comprised spatial data.

Any cadastral system must support public and economic interests and as well protect the private data of the property owners. Such system should not hold incorrect or unreliable data, especially because of the interlinking capabilities of it with other related databases. The declared and enacted publicity principle of cadastral system must be leveled in order to safeguard real estate owners against possible incompetent access and misuse of cadastral database. The appropriate balance between the public admission to cadastral data, copyrights and protection of personal data about owners must be carefully considered. On the other hand, a cadastral system that is to tight, by applying various legal, technological, political or organizational obstructions, cannot perform its basic role and promote social development.

6.1 The Importance and Value of Real Estate Data

Cadastral systems are important institutions for partial control over the status and usage of real estates. They provide support for land use planning and as well are basis for functioning of real estate market. The main roles of real estate and specially land cadastral system are:

- Real estate identification (location, characteristics, value etc.),
- Technical support for title registration (together with land registry),
- Assessment of real properties (together with taxation office),
- Logistic support for effective free market of real estates (real property valuation register).

- Pricing policy and marketing of cadastral data will be prosperous especially for that kind of data, which users more often need and consequently for such data exist greater demand or interest. If the price of cadastral data on the market grows up to high or out of some reasonable proportion, users can seek for alternative and less expensive data sources. Such circumstances can cause various side effects as for example:
- Data redundancy and possible indirect sources of cadastral data,
- Various misusages of cadastral data, copyrights abuse, privacy infringements etc.,
- General resistance and opposition to registration of real properties transactions,
- Less reliable, out of date and worse quality of cadastral data etc.

6.2 Financing and Pricing Strategy

Cadastral systems were traditionally financed from various budgetary sources. During the last decade in EU countries there is a strong tendency to establish a reasonable economic efficiency of cadastral systems, mostly by marketing cadastral data and services to various users. Therefore new organizational and business models for cadastral system have emerged. With such development the traditional cadastral system as a public service transforms into a more market oriented organization, which becomes dependent on the sale of cadastral data and services. The ownership and copyrights of cadastral data becomes the crucial issue and should be legally defined (Cho, 1998). Further on it becomes more evident that the appropriate level of cadastral data quality (completeness, logical consistency, positional, thematic and temporal accuracy), and as well liability for data quality must be determined at least by the provisions of a metadata standard.

The main purpose for marketing real property data and cadastral services is to lessen the costs for maintenance of real estates cadastral system. The ultimate goal is to establish a cadastral system that will cover its costs or even produce moderate revenue (Zevenbergen et al., 2001). The financing of such a system over the customers fees probably should not become the first-hand business strategy, which would entirely replace the traditional budgetary scheme. After all cadastral system is public welfare, such as are also topographic databases, coordinate systems etc., which should all be considered as the basic spatial infrastructure in any country.

Maintenance and support of cadastral databases is permanent responsibility of special public organizations in most of EU countries. Such activities have been generally financed from the state or local budgets. Revenues created from cadastral activities, on the other hand, are most often direct budgetary inflow. It is therefore difficult to determine the proportion between outgoings and incomings of such activities. The consequence of non-transparent public financial flows can also show up as low level of public services in general, weak concern and support for users, and ineffectiveness and costliness of such public organizations.

Cadastral data support taxation of real estates, such as land transfer taxes, property tax, income tax etc. Cadastral system creates revenues over fees for data and information services, various technical activities, compensations for land use changes, fees on real property transactions and registration, mortgage service etc. Cadastral data and services represent also important source of income for various professionals, such as notaries, property agents, real estates valuers, credit institutions and banks, and as well for the majority of surveyors or geodetic engineers.

In Slovenia the business and financial models for cadastral services must be modified and transformed into more reasonable and effective ones. Assessment of the achieved level of services for the existing and potential users, and fair structural analyses of revenue that is gathered from the existing and foreseen cadastral activities, should form the starting-point for the organizational and particularly business model transformation. The objective comparison between the direct revenues and costs needed for carrying out cadastral activities, and appropriate organizational, technological and managerial renewed business models, offer new possibilities and solutions.

7. CONCLUSIONS

The main prerequisite for effective functioning of real estate market and as well for massive market with spatial data and information is harmonized legislation. Carefully coordinated legal system is also the foundation for remodeling of geodetic services from the traditionally administratively evaluated activity to a more market oriented one. Such more business oriented geodetic services are also the precondition to increase their efficiency and as well their effectiveness. The development and enforcement of the described legislation in the country of economic, social and political transition has not been a straightforward process. Additionally, a set of sub-laws and regulations has been carried out, which are crucial for putting into force the whole legal system and also for its consistent implementation in practice.

The massive use of digital cadastral data and other geodetic products puts out the copyrights issues, and consequently exposes the moral and material rights. In Slovenia the Law on geodetic services (2000) formally defines, who in principle possesses copyrights on spatial data, but some more detailed regulations are still missing. The consistent strategy for licensing and user oriented pricing policy of indemnities for spatial data and services is gradually prevailing. Despite such formal orientation in practice spatial data are, probably primary because of economic reasons, still often the subject of gratuitous and unregistered distribution.

The privacy issues in spatial databases that are maintained by geodetic services in Slovenia

are formally well covered by the present legislation (1999). General public interests, the declared publicity aspect of cadastral and other databases, which are supported by GIS technology, and on the other end the touchy privacy protection of individuals, should be properly balanced. The liability for spatial data quality and the level of such responsibility are still technically and legally an open issue. In general, geodetic service in the country does not provide explicit guarantee about the quality of their spatial data, and therefore also does not assume legal responsibility in the cases of detriment that is caused by insufficient data quality. The outlined liability approach is still prevailing, but should be altered for the benefit of spatial data users, if in the near future the primary aim is to set up a massive market with spatial data, where the market value of data for their end users will be the dominant factor of success.

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BIOGRAPHICAL NOTES

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In 1980 I completed engineering degree at the University of Ljubljana, Faculty of Civil and Geodetic Engineering, Geodetic Department. In 1987 I concluded regular postgraduate studies at the same institution. PhD (doctoral) thesis I defended in 1993 also at the Geodetic Department. Additional postgraduate studies I carried out in 1986/87 at the ITC, Enschede, NL, as a one-year postgraduate study course on Land Information Management with the cadastral orientation. In 1991 I also spent six months as research fellow at the Technical University Deft, Faculty of Geodesy, NL.

As Associated Professor I teach several subjects at the Faculty of Civil and Geodetic Engineering, related to computer and GIS technology application in geodesy, on both graduate and post graduate studies. My research work concentrates on several GIS technology fields, such as standardization, legal issues related to spatial data, GIS databases, conceptual modeling, application of OOAD tools for cadastral database modeling etc.