Cadastre and Other Public Registers: Multipurpose Cadastre or Distributed Land Information System?

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Key words: Cadastre, Land Registry, Property, Taxes, Land Use, Territorial Planning, Land Preservation, Environment, Databases, Public Registers, IT, Organisation, Cooperation, Standards, Formats, Distributed Information System of Public Administration, National Information Policy.

SUMMARY

The content of cadastre should generally be arranged according to real needs. Land policy and land management will need more a more reliable and complex information for correct decision-making. That is also a reason of continuous pressure to extend the content of the cadastre by other data needed. There is a question if this is the best way, especially at present, when each individual sector of state administration runs its own specialised registers and databases with data belonging to their competency and responsibility. Present state of IT enables to link individual public registers (or databases) of different ministries and to create a wider distributed land information system for use by both public administration and private sector. The cadastre should provide data on ownership and position and thus become a backbone of the whole national system.
The paper describes prerequisites for such solution (legal framework, coordination, unification, standards and formats of data, etc.) and the first experience in the Czech Republic.

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1. HISTORICAL BACKGROUND

Modern cadastres in Europe were established in the18th century as economic tools of sovereigns. The content of the cadastre was adjusted to the real needs of taxation and the office established for keeping it was equipped with full competency to do it. It was self-evident that the office was fully powered to define, decide, gather, keep and use the data needed for tax purposes and was entirely independent on other authorities.

Later the content of the cadastre became step by step wider and the cadastre started to serve as multipurpose tool, not only for tax purposes. From the beginning the cadastre usually became the technical part of land registry system. But the cadastre as a unique and extremely wide tool, the only one completed with maps (offering localization), started to be used even in other branches of administrative and economical life.

Nowadays the multipurpose cadastre contains a great amount of different data from different branches of complicated administration. The content was substantially widen, but the competencies to define, decide, gather, keep and use of the data are not concentrated within the cadastral office but distributed among dozens of other administrative bodies. The content was widened, but the competencies were practically narrowed.

In this way the cadastral offices maintain a great amount of data with greater or lesser difficulties because the competency and responsibility corresponding to the data lies somewhere else. Keeping and maintaining the cadastre is more and more complicated for the cadastral offices because permissions or decisions of other administrative bodies are needed. Even keeping data and their using is bounding and limited by laws and subordinated to other specialized administrative bodies.

It is high time to start to solve the questions of appropriate competencies and responsibility to remove all the obstacles of effective maintaining of the cadastre.

2. PRESSURE ON WIDENING CONTENT OF CADASTRE

Complexity of modern life brings complexity of law, which requests to respect a great amount of phenomena in decision-making. The permanent tendency to widen and widen cadastre content with additional and new data needed for competent decisions is apparent. The content of data is still widening, but maintaining of the cadastre without appropriate competencies is more and more difficult and ineffective. Since the competent decision-making needs not only updated but also reliable and valid data, the relevant question of legal validity and responsibility for data kept is more and more important.

The need to widen the content of cadastre is supported even in FIG publication "CADASTRE 2014". It suggests substantial widening of the content of cadastre (in the only one cadastral database) to create more reliable and all-embracing tool for decision- making about land.

3. OTHER PUBLIC REGISTERS

Within modern state the competencies of state administration are distributed among several individual ministries. Every ministry or their subordinated administration bodies makes decisions in a certain sphere of governmental or municipal level. For the purpose they usually run their own lists, databases, registers or even public registers. Beside the cadastre and land registry, there are great amount of other registers, as e.g. register of citizens, register of economic subjects, tax register, register of roads, registers of utilities, registers of physical planning and building activities, registers of land prices, registers concerning the nature and its preservation, environment registers, registers of cultural heritage, and many others.

Some of above mentioned files are still in a traditional paper form, but many of them are digitised and run as databases. The rate of digitised registers is permanently growing and there is only a question of time when the paper form will extinct entirely. The total amount of information kept is immense, and some of them have substantial, and in some cases, even legal consequences in everyday life.

The cadastral data (as parcel number, or interpretation on cadastral map) are used by many of these registers for localization of phenomena kept. In some cases the competent body decides and the result of decision is handed over to the cadastral office and the proper information is recorded and kept directly in the cadastre, which in such a way substitutes poorly working or even missing information system of own. Consequently, there are, of course, problems with updating.

Generally, there are serious problems in access to huge amount of the data scattered in many isolated files or databases of individual administrative bodies.

4. LAND INFORMATION SYSTEM (LIS) OR SOMETHING MORE?

A considerable number of laws and regulations influence everyday life of people on the planet. Correct decision-making in present complicated world require great amount of up-to-date, reliable and complete information, often from many branches of administration. Some information is bounded to the land as to the base of most human activities. That is the reason why idea of the land information system (LIS) comprising all relevant and needed information concerning to the land have emerged. In fact, beside the huge volume of data in the only one database, there is nothing to limit the extent of data only to data concerning to land. The volume of data and their maintenance, as "hungry stepchild", can be solved by distribution of both the data and their updating among more proper databases and their administrators. Since such databases in principle exist, the only problem is to broken their present "splendid isolation", interconnect them, and force to co-operate. As the result, a much wider distributed information system of public administration could be created. Present state of IT offers suitable technical tool, organisational conditions depend first of all on us.

5. NEW APPROACH TO INFORMATION SYSTEMS

In present situation when the cadastre, as an isolated system, in a certain extent has to substitute some other poorly working (or missing) information systems of public administration should be changed. The content of the cadastre should be narrowed and limited to the information where cadastre has its full competency and responsibility and is able to maintain the data reliably (spatial data of parcels, registration of rights, taxation data). Other data should be handed over to ministries within their competencies.

5.1 Main principles

Present state of information technologies enables to remove isolation of existing databases and to create a Distributed DB Network of Public Administration, where:

- Each part of state administration does its own job (within its own competencies) and keeps the information in its own DB with full responsibility,
- The databases are interconnected. United standards, formats and keys enable to exchange and complete existing data and to create new complex information according to actual need,
- The cadastre except its own data (about land and rights) provides the whole system with unified spatial data for all the databases,
- The information kept in databases is very carefully selected according to its signification, reliability, real needs, and cost-benefit ratio.

Easy access to data for everybody, multiple use of data once captured, clear responsibility and legal validity of data kept, and possibility to build and extend the system step by step, may increase the efficiency, minimise costs and create better conditions for cost recovery (within the whole IS). The priority should be given to basic registers of the whole system such as the Register of Cadastre, Register of Citizens, Register of Economic Subjects, Register of Taxes, Register of Environment, etc.

The cadastre as a general provider of spatial data for the whole IS gains on importance.

5.2 Prerequisite conditions

The idea of distributed DB network of public administration is very simple. But the practical creation of such IS is rather complicated. Appropriate conditions are needed in legislation, organisation and co-operation. Unified standards, formats and keys are substantial. Probably, the unified information policy is inevitable.

5.2.1 Organisational aspects

Organisational tasks in building up of the project of such extent are challenging. Co-ordination and close co-operation among the all participants is of paramount importance. Basic conditions should be determined by legislation.

5.2.2 Legislation framework

Appropriate legislation framework is very important. Basic conditions for individual databases and their interconnection, co-ordination and co-operation, content of databases, unification of data standards and formats, etc., should be defined by legislation.

5.2.3 Unification, standards, formats, keys

The main way how to enable the working interconnection among different databases is unification and standardisation. Unified standards, data formats, and keys should be defined, and all databases involved have to be adapted to the requests.

Preferentially the basic registers should be interconnected and then the system should be extended step by step, according the need and possibilities.

6. ADVANTAGES

The advantages of such unified information system of public administration are clear:

- Easy access to the data kept in IS for everybody with limitation only due to law (probably some personal data)
- Clear responsibility and legal validity of data kept
- Multiple use of data once kept enables to minimise costs and creates better condition for cost recovery (within the whole IS)
- The net of individual interconnected databases (Unified Distributed IS of Public Administration) corresponds to distribution of duties and responsibility of individual administration bodies, and create basic conditions needed for reliability, relevance, and validity of data kept in IS.
- The whole IS can be build up and extended gradually, according to real needs and economic possibilities. Most important registers should be preferred.
- Special and indispensable role of the cadastre, as a general provider of unified localisation data for the whole IS, raises its importance.
- Even interconnection of several few basic registers can bring significant results. Basic registers as a backbone of the whole system should be preferred:
  - Cadastre and Land Registry
  - Register of citizens
  - Register of economic subjects
  - Register of taxes
  - Register of territorial planning
  - Register of environment, etc.

These principles enable to build up gradually a wide IS of whole public administration with all the advantages for the all users.

7. FIRST EXPERIENCIES

The first step to this very ambitious goal has been made and the present cadastre co-operates with the register of citizens and the register of economic subjects to get data about the ID numbers and addresses of owners registered in cadastre. This co-operation is based on the governmental order No 111/2001 on comparing and taking over data into cadastre. The next step under preparation is to involve the tax register and register of environment.

The government of the Czech Republic have adopted The Conception of the State Information Policy and the Action Plan of Implementation of State Information Policy. The cadastre is considered as one of basic registers.

Former Office for Public IS (since 1.1.2003 Ministry for Informatics) has prepared the Law No 365/2000 on Information Systems of Public Administration. The law determines first of all the rights and duties concerning to building, use, running and development of IS of public administration, and defines the basic concepts. The Law on Public Registers is under preparation. Beside that the Ministry of Informatics has issued a complex of standards valid for public IS.

First experience shows that no ministry is keen on giving up of their data free of charge, and that the current "comfortable isolation" is defended. Mutual co-operation seems to be more or less forced. The proper process of adaptation databases to unified standards will be rather long-term and tedious.

8. CONCLUSIONS

In spite of the first humble achievements the idea of distributed database net of public administration is of good perspective. Present isolation of the cadastre should be broken and the system open. The cadastre as one of the basic registers of the whole system plays an indispensable role. It is a great challenge for surveyors to make the most of it.

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BIOGRAPHICAL NOTES

Dipl.-Ing. Ivan Pesl, born in 1944, graduated from the Technical University in Prague, Civil Engineering Faculty (surveying and mapping) in 1966. He worked on many posts in Cadastral Offices. Post-graduate studies of geodesy at the Technical University Prague finished in 1975. In 1980 he was given the authorisation in surveying for cadastre and civil engineering. Many papers and articles in professional journals document his activities on the field of cadastre. At the beginning of the cadastral reform in 1993 he was a head of newly established Cadastral Department of the Czech Office for Surveying, Mapping and Cadastre. In present time he is a head of the Surveying and Cadastral Inspectorate in Opava and a national delegate to the FIG Commission 7.

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