

# Reorganizing Public Access to Property Information by Remodelling and Standardization

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**Key words:** cadastre and property information, standardization, data model, data exchange, XML-format and one-way entrance.

## SUMMARY

Information about real property includes cadastral data, valuation data, building data and similar spatial legal objects. Through the last thirty years property data borne in different public agencies and institutions based on different object domains have been digitized and databases converted to relational databases. These databases are now being changed to be stored in XML-formats prepared for WEB-communication. Until recently data were only accessible in isolated paths and connections to the individual DBMS systems. A common data model was chosen and implemented in the different registers and this has created the possibility of real-time data exchange from different sources and object environments to the same user interface based on the World Wide Web.

This means that the citizen and the owners only have to go to the same URL-address to look for information about their property even though the professional responsibility for updating is still placed in the “old authorities” or professional bodies.

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## 1. BACKGROUND AND INTRODUCTION

Property data play a central role in the social administration. They participate basically in securing documentation and information on the physical-spatial organisation in society.

During recent years considerable changes have taken place as regards the property data collections. Data have to be still more accessible and to all types of users.

These property registers now all exist in data bases, but as a result of different professional traditions and marked by their respective knowledge domains. During the latest five years the Internet development has increased the wish for easy accessibility to these data sets and through user interfaces defined by the needs and preferences of the users. Previously the citizens and the enterprises accepted to have to collect property information from different authorities, and it was an expert work to collect these data. As a consequence of the Internet development these property data must now be accessible via the Internet which demands *standardization*. There is, however, also a political demand for simple user interfaces so that citizens and enterprises only have to look one place to get the necessary information. This means that data on real property have to be remodelled according to the same conceptual data model to achieve clarity and precision in the communication with the citizens.

Property data still play the same central role in the social development, but as a consequence of the IT development, where all data become digital and distributable, an increased accessibility and transparency develops.

## 2. PROPERTY INFORMATION IN DENMARK

The development of property information in Denmark is closely connected with the entire development of a National Infrastructure for Spatial Information (NISD) and the whole sector for GeoInformation. During the latest two decades all the data about property information have been based on modern RDMS-technology, and information from the different sources is available through their own WEB-services, but until now a poor coordination in the running systems. This is changing actually.

### 2.1 Cadastral Information

The cadastral register is a national register that contains information in relation to the Act of Land Registration, the Agricultural Act and the Forest Act. In the cadastral register there is information about areas, registration conditions about for example farms, forest reserves, road and water areas as well as property numbers and journal numbers in connection with cadastral cases.

The Danish National Survey and Cadastre has the responsibility for the data and the updating and maintenance.

## **2.2 Valuation Information**

The Valuation Register (SVUR) is a national register which contains valuation information including information about property and land value. The valuation information builds on information from the Building and Dwelling Register about the age, area, materials, installations, etc. of the properties. The municipalities use the information for calculation of property tax.

The Ministry of Taxation has the data responsibility for SVUR and updates the information through the information from a municipal register on property relations.

## **2.3 Building and Dwelling Register**

The Building and Dwelling Register (BBR) is a national register that contains information on building and dwelling matters. This means that the register also comprises buildings like for example churches, hospitals and castles.

The register is used by both national, regional and local authorities as well as by utility companies and private enterprises like for example estate agents and mortgage-credit institutes.

- The local authorities use BBR information in connection with specific procedures like for example building cases and calculation of water charges and drain contributions. The BBR is also used for calculation of property valuation and in connection with analyses and planning tasks.
- The regional authorities use BBR information for a number of tasks within the environmental and planning fields.
- At the national level there are many authorities using BBR information. The Ministry of Taxation, Central Customs and Tax Administration for example uses the BBR information for fixing of property valuation. In addition, the BBR information forms part of a number of administrative systems in the state like for example BOSSINF, which is used to support building activities and urban renewal.
- Utility companies use the BBR information in connection with planning and analysis tasks and in connection with the fixing of duties. The BBR information is especially used within the supply of water, heating and natural gas.
- Private enterprises use the BBR information in connection with trade, financing and insurance of property.

The Ministry of Commerce and Financial Affairs has the data responsibility for BBR. It is the task of the local authorities to update and maintain the BBR. The register is updated currently, for example in connection with building cases.

### 3. THE OFFICIAL STRATEGY ON E-GOVERNANCE STARTS IN 2000

In the year 2000 the Danish government decided an overall strategy for the development of the information society. It was stated that when applied successfully, information technology is a source of economic development, improved quality of life and better service, both public and private.

Therefore there is a need for a strategy that places Denmark in the forefront of the development towards an Information Society.

The public sector should be actively involved with the private one and be the leading force in the efficient use of information technology.

Public administration at both the central and the local level must be connected by an electronic service network, which shall provide better service for both citizens and companies as well as more efficient administration.

The establishment of such a service network means that information which has already been given to one public institution by citizens or companies should not be requested by another agency. For citizens and companies it should be possible to send letters and information to public authorities by electronic means - and receive answers the same way.

The components of a service network include the following:

- All citizens shall be offered an electronic Citizen's Card with picture and PIN code. Consequently a number of other public identification papers, documents and certificates will become superfluous.
- All public authorities shall establish an e-mail box to which all citizens and companies can send letters and information by electronic means. A legislative overhaul shall ensure that requirements as to substantiated documents in writing and other obstacles to paper-free communication are removed.
- Public authorities shall develop electronic self-service systems, which can be made available to users and customers from computers and telephones at home or at the workplace.
- Public sector communication with companies shall be simplified by means of a central register of companies and an attached *CVR code*, similar to the *CPR code* for citizens.
- Public institutions shall put an end to paper-based files, and processing tasks will be based entirely on electronic means. Legislation within the area of public administration will be adjusted accordingly.

### 4. LOGICAL DATA MODEL FOR PROPERTY DATA

On behalf of this overall Danish strategy a coherent work was started to reorganize communication procedures and data models. This work also included the property information registers. The conversion of the property-related data collections to digital form and an increasing interest for an integrated utilization of these data have resulted in a data model for the property data field.

Some of the purposes of the logical property data model are:

- to support both existing and new transverse uses of property data
- to create easier and more flexible access to the data collections and
- to contribute to a rational reuse of data and with that an optimal resource utilization.

On this background and an assessment of the business fields – land registration, cadastral changes, property valuation, etc. – connected with the central property-related data collection, a logical data model for the property data field has been drawn up under the auspices of the Danish National Survey and Cadastre.

The data model has been drawn up on the basis of the knowledge of administration traditions and the legislation connected with the respective business fields. In the model the previously mentioned modernisations of the different registers are involved. It is planned to use the model in connection with new systems within business areas with relation to the property data field. The goal is co-ordination and that consistent data can be exchanged across different business fields.

## **5. NATIONAL PROJECT ON E-GOVERNMENT FROM 2001**

Project E-government has been initiated by the central government and the regional and local administrations in order to promote and coordinate the transition to e-government in the public sector. The project is led by a joint board made up of the permanent secretaries from five ministries, the managing directors of Local Government Denmark and The Association of County Councils in Denmark which represent the municipal and regional authorities, respectively, and finally a representative from the municipalities of Copenhagen and Frederiksberg.

The project has been running for three years from 2001-2004 and has just been extended for four more years. The board is served by the IT-Technical Centre in the Ministry of Science, Technology and Innovation and the Digital Task Force which is based in the Ministry of Finance. The Digital Task Force also serves as the secretariat of the board. The guiding idea behind Project E-government is that the responsibility for the implementation of e-government lies at the decentralized level, but that in several cases there may be a need for common guidelines and solutions to general problems of legal, technical, and organizational nature in order to support the transition process. The need for a cross-level effort was stressed in a whitepaper on e-government published in May 2001 (Danish only), and the project was agreed on in the annual negotiations with the regional and municipal authorities in June 2001.

One outcome of Project E-government is the “Service Community for Geodata”. This service community, established in 2002, is led by a steering group with representatives from the Ministry of the Environment, Local Government Denmark, The Association of County Councils in Denmark and the National Agency for Enterprise and Housing, the Directorate for Food, Fisheries and Agricultural Business and the National Survey and Cadastre (KMS).

Some of the objects of the service community are to:

- develop and formulate a vision and a strategic framework for development of geodata – including property information - in Denmark,
- secure co-operation on data, access to data modelling, etc.
- To promote development of geodata services for many different public and commercial services.

## **6. FOCUS ON THE CITIZEN'S ACCESS TO ALL DATA THROUGH THE SAME INTERFACE**

An Internet access has to be established to the public authorities which the citizens can adapt according to their needs. It shall give the citizens access to all publicly registered information on themselves, to a tailored information system as well as easy, fast and secure self-service.

The individual citizen is offered a complete access to precisely the public information and services that are relevant to her through a personal Internet access to the public authorities. Here she can get access to the information registered about her by the public authorities – and possibility of following own present cases – by means of a digital signature. The citizen must have the possibility of tailoring her personal Internet access so that exactly the public information and news, in which she is interested, is presented first. The personal access to the public authorities must also give access to self-service by means of electronic forms.

Under the auspices of the Ministry of Commerce and Financial Affairs a work has been in progress about developing and implementing an “Offentlig InformationsServer (OIS)” (a public information server). The concept around OIS has to give potential users – citizens, enterprises and public authorities – the possibility of collecting data from the public data collections, including property data, through the Internet.

Through the information server users and citizens are offered:

- access to own data
- access to surveys, statistics, etc.
- possibility of data selection for distribution purposes
- possibility of submission of applications, notifications, etc. for public authorities.

The implementation of OIS has been divided into three phases:

*Phase 1* which includes the elaboration of a specification of requirements, supply and technical development as well as implementation of the server will comprise data from the BBR, the ESR, the Planning Register, the Cadastral Register, the Cross Reference Register and the National Sales and Valuation Register.

*Phase 2* will offer the possibility of transfer of data – via the information server – from the public data collections to enterprises who wish to set up as data distributors.

*Phase 3* will open for further development of the server with a view to offer further services to the users. The public information server was started in spring 2001, and phase 1 and 2 have now been carried through (spring 2002)

*Subsequent phases* where property data from other sources will be available are planned. The next focus will be on spatial legal planning documents and data from the Land Book (Ministry of Justice).

The concept of this public information server is most topical in Denmark. The public information server offers “a contemporary entrance” to the data sets of different authorities. With that it offers the citizens and enterprises the possibility of only having to apply one place. Such “portal models” are expected to get great influence on the development of the digital administration of the public sector.

## **7. XML, METADATA AND PKI (DIGITAL SIGNATURE) – CONCEPT AND INTER-CHANGE.**

The Danish Strategy for e-administration also includes an organization to promote knowledge sharing for organizations and individuals involved. OIO.dk (public information online) is a central government website for everybody who deals with e-government and the implementation of IT in the public sector in Denmark. On OIO.dk, a series of tools are contributing to securing the basis and coherence of the public sector's use of IT.

The strategy for the further digitisation of the public sector is, with the increased use of IT, to improve the public sector and deliver better services to the citizens. The prerequisite for accomplishing this is to create a better IT integration between public authorities and private companies. Another prerequisite is that all citizens in Denmark are to be ensured the option of a digital signature.

To achieve this, a committee on electronic government was constituted in the autumn of 2001 under the Ministry of Finance. The work of the committee has thus so far resulted in two initiatives: One to ensure the implementation of XML as the communication standard in the public sector and another to ensure the option of a digital signature. In connection with the XML project there is furthermore an ongoing task regarding standards for metadata. For involving the GeoInformation data a further standard GML for describing the spatial objects has been chosen.

## **8. BEGINNING E-LAND ADMINISTRATION**

The constant development of new communication and storage technologies of the information society means that the work up till now on standardizing and developing is facing continuous challenges.

Some of these consist in further increasing the accessibility through the World Wide Web. There has already been acquired much experience in Denmark in that respect at present.

The public property server (www.ois.dk) offers the possibility of procuring data from property registers across existing separated systems through an ordinary browser. Therefore it is possible to get information from the Cadastral Register, the Valuation Register and the Building and Dwelling register in this way. With address, title number and property number as search key information about the single property can be procured.

The Danish regional authorities have all established WEB servers where all can look for information in a GIS-based user interface on properties situated in the regional area. Here it is possible – besides property information – to get administrative data on natural protection, planning areas, EU-support entitled areas and natural areas. It can all be presented on the basis of current and historical maps, orthophotos, etc.

Digital planning is, however, to be developed further in the years to come so that a complete basis for e-land administration is established. The Service Community for Geodata has elaborated a strategy on a new planning information system for local authority planning data. The strategy contains a description of a new planning system which can secure a national homogenous establishment and access to the planning data of the local authorities. The background of the report is a broad need of qualitative planning data in both the public sector and among enterprises and citizens.

The Service Community has emphasized the importance of the new planning system being able to handle both the property data and geography of the plans. Besides it has been a wish that a new planning system shall base on the common standards for exchange of data (WMS, WFS and GML) to the greatest possible extent as recommended by the Service Community for Geodata and Geoforum - standards which also follow international recommendations in the field.

These years the mobile phone development creates the possibility of using wireless telephony to search for and find property information. This means that we can move around in the field or in the streets of the towns and on the spot get information about the property objects we are facing. This development is still only in its first stage. It is certain that the development of broadband telephony will create quite new possibilities of searching in databases of any kind. As to property data in particular this will imply that “traditional office work” can be done in the field.

## **9. STEPS TO BE FOLLOWED**

However, in the next few years the Internet development will also make possible quite new and more geographically oriented search principles like for example use of 3D models to navigate and search for property-related information. The development of these new search principles will be further enriched by the endeavours to develop a global standard for exchange of spatial information. The so-called GSDI work (Global Spatial Data Infrastructure) has already started and will bring about new fields for knowledge and method development with focus on the integration of data across frontiers.

In this context it is central to stress that the very sectorized Danish property information systems will undergo quite considerable alterations, also with regard to sphere of responsibility. The legal basis for and the construction of the administrative routines behind these property data systems will undergo alterations in consequence of the IT development. Today the many organizational-administrative changes, which the new systems will permit and catalyze, have not been tackled at all. This will take place as a necessary consequence of the strong focus of the Danish government on digital management.

However, finally there may be reason to emphasize that the basic function of the property registers and the cadastral system – to control the spatial rights, revenue, regulation and realization – continuously will make out a backbone function in the balance between the public and the private sector.

In continuation of the development towards digital management we will see an increased co-operation between public authorities, who in service and production communities will be able to increase the co-operation on production and consumption of geodata for administrative purposes and for digital management. This will break up the traditional boundaries between existing ministerial spheres, for example the ministries of commerce, justice, environment and agriculture in Denmark. In this way we are professionally facing quite new co-operation concepts around the entire knowledge field which internationally is described as *Spatial Information Management*.

This development has started in the property and geodata field in Denmark. In the first place there is a very great social potential in utilizing the investments of the latest years in digital maps, co-ordinate-fixed addresses and systems, etc. for geodata mediation. In the second place geodata are to contribute to the general digitizing of the management, which is given such a high priority by the Danish government these years. Property and geodata have to be integrated into new, usable and more efficient digital solutions to the benefit of both citizens and private enterprises as well as the public sector.

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## **BIOGRAPHICAL NOTES**

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