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The Basic Data Programme in Denmark

Abstract

This paper describes the purposes of the Basic Data Programme for Statistics Denmark (SD) and for the state. Which effect will it have on the quality of basic data for us who are engaged in the production of statistics? What are the challenges and what are the options?

Administrative data has been used by SD for many years. Through the Basic Data Programme, which will be in production in the first half of 2017, we will obtain a higher quality of administrative data. Some databases will be closed and their data transferred into other registers. Many databases are now connected through keys where you use the same identification for companies, people, addresses, property and a common framework for mapping data.

The first Common Basic Data, initiatives in Denmark, was the fusion of 2 ABR with the Statistical Business Register (SBR) in 1998. SBR has since been an integral part of the administrative Business Register, which is accessible on the web with free access to data.

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In recent years, the Danish Parliament has requested the use of administrative to be optimized. This is achieved by coordinating the data collection to avoid collecting the same data twice and by creating unique keys between the various data. At the same time, it has also been a desire to make some of the data accessible for the private sector.

The administrative data, which has been identified as Basic Data, come from different authorities, such as ministries, municipalities and regions.

The Danish public sector has a long tradition of registering high quality information on Denmark and its citizens. These registrations are collected digitally and stored in vast public registers, such as the Civil Registration System, the Central Business Register and the Building and Dwelling Register.

With the Basic Data Programme, basic registrations about Denmark and its citizens are combined under the common term Basic Data. The data are standardized, so it can be combined and used coherently. Relations between various Basic Data are clear, so it is, for example, possible to see that a person owns a house, which is located on a street. Along with the combining of registers, the quality

of data is improved and new data is added. Thus, you can be sure that the data you use are correct, complete and up-to-date.

In addition to this, some of the Basic Data are made easily accessible and free to use, for everyone – authorities, businesses, citizens. Data are distributed via the shared distribution platform, the Data Distributor, from where it can safely and easily be used – with the exception of personal and sensitive information.

The Dutch program on eGovernment show a lot of similarities with the Danish 'Digital Agenda' in this respect. The authors of the papers of Statistics Netherlands (Rico Konen) and Statistics Denmark (Steen Eiberg-Jørgensen) collaborated to focus on the different approaches of both countries to achieve similar objectives.

1. Introduction

In Denmark there are good administrative registers, good digital geographic data and good relations between the different registers and in addition Denmark has good addresses.

The public sector in Denmark has a long tradition of registering information at a high-quality level concerning Denmark and the Danish citizens. Since the beginning of the first records in church and land registers, basic data has been decisive in ensuring an efficient public administration in Denmark, e.g. data real property, persons, businesses and geography. In the beginning the registers were local, but since the 1960´s they have become national.

However, the data collection has not been coordinated, which for example meant that some data has been collected more than once and not necessarily in the same format. Therefore, the government decided to launch "The Basic Data Programme". This project aims at gathering the basic registrations concerning Denmark and the Danish citizens in a standardized form, so they can be combined and used in a coherent way. In a preliminary work the main administrative registers in Denmark have been identified as the Basic Data registers. These registers contains basic data on persons, businesses, buildings/dwellings and roads/addresses and more geographic information, e.g. geographic maps and maps showing altitudes and data on water and climate. The Basic Data registers are part of the Basic Data Programme and they are described in a common data model.

Using the data in a coherent way implies, for example, that it is possible to see whether a person or a business owns a house with a common reference to the location via a good address. All Basic data have a unique reference number, thus making it possible to link data from one register to another register in Basic Data.

Another aim with the project is to make the data easily accessible and free to everyone, public authorities, businesses and citizens. The project will provide a better basis for the public sector to become more efficient in its daily administration and thereby lead to savings of an estimated minimum of 50 million euros per year. At the same time, it becomes a starting point for private businesses to obtain primary basic data for free, which can be used for developing new, intelligent solutions and products. This is expected to result in growth of a minimum of 75 million euros annually in the private sector.

2. Network of Basic Registrations

Attention in the Basic Data Programme is focused on improving the coherence and quality in the existing primary administrative data, avoiding redundancy in the data and avoids duplication as well making them freely available to everyone in an easily accessible way.

As already mentioned, data coherence and higher quality are expected to result in rather great savings with regard to operating the registers in the public sector. The administrative registers will begin to do, what SD has done for four decades, i.e. link the different registers.

In practical terms, particularly the improvements concerning the real estate/property registers and road registrations will be of value to Statistics Denmark.

The real estate/property registers will have a common frame of reference. At present, there are two registers with addresses and they will be combined into one. There will be new requirements regarding how data must be updated and which data there need to be in other datasets before, for example, the addresses can be updated. There are for some registers new standardized requirements for the recoding of history of the data. All variables in all of the registers will have two sets of historic dates (from_date/to_date and time of registration).

In connection with the project, the Danish government has freed the data, which were previously for sale, and has also funded a great part of the modernization. The costs have been estimated at approximately 150 million euros, which have been covered by centralized cutbacks in the financial grants. Consequently, enhancement of the efficiency in the public sector amounting to 35 million euros annually (to pay the 150) is expected as well as the expected growth, by using free data, in the private market will finance a part of the investment.

Figure 2: Registers in the Basic Data Programme

The Statistical Business Register is the only register in SD, which delivers data to the Basic Data program. This is conducted indirectly through the ABR, which is supplied with information on industry and number of employees. Information on the number of employees is obtained from an administrative register e-Income maintained by the Danish tax authorities and contains information on all employees in Denmark.

2.1 Organisation of the Basic Data Programme

The project aims at standardizing the basic registrations concerning Denmark and the Danish citizens and businesses, so data can be combined and used in a coherent way.

The data are made easily accessible, especially with regard to individual inquiries, but it is also possible to undertake full-scale data extracts.

Another major objective of the project is that it must give rise to growth in the private sector, which is an expected outcome of free access to data on an almost equal footing with the public sector.

Access is not only given to companies but to all citizens.

The Basic Data Programme is to improve the coherence and quality in the existing registers. The authorities who own the various registers have collaborated on new definitions and eliminating duplication of information and subsequently to introduce unique identifiers to facilitate combining data from the various registers. This has greatly improved the quality. For example,

- Residential units have been uniformly defined and the individual unit has been assigned a unique identification number. All addresses are now in a single register and this register is to be used by all authorities, who will no longer maintain their own version.
- Map of land use has been improved by e.g. better indication of local urban-planning and division into urban and rural zones.

In the future, it is expected that the free access to data will increase the number of users who in turn will expect good quality data and thus put pressure on the data providers to continuously improve quality.

Access to data in the future will primarily be through the Data Distributor, which will ensure that the public sector always working with updated data. Some users like SD will have a copy of the data and only extract changes. But for all applies that the data are retrieved from the same template and delivered in the same language as opposed to today.
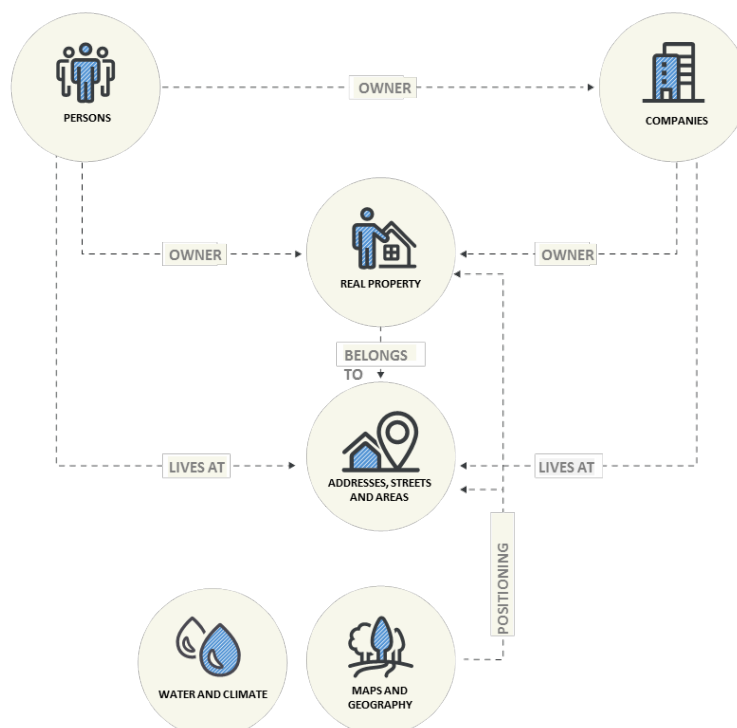
The project includes basic data on persons, businesses, buildings and roads and more geographic information, e.g. geographic maps and maps showing altitudes and data on water and climate.

The different register owners have cooperated closely with regard to definitions and opportunities. It was not all register owners who were equally satisfied[1] with the cooperation during the entire process, but there was a clear mandate from the Danish government and strong common understanding that in order to succeed it was necessary to reach an agreement. At the same time, the project was embedded in a government agency, which was not a register owner, but whose purpose was to enhance the efficiency of the public sector´s data solutions.

Organisation of the Programme
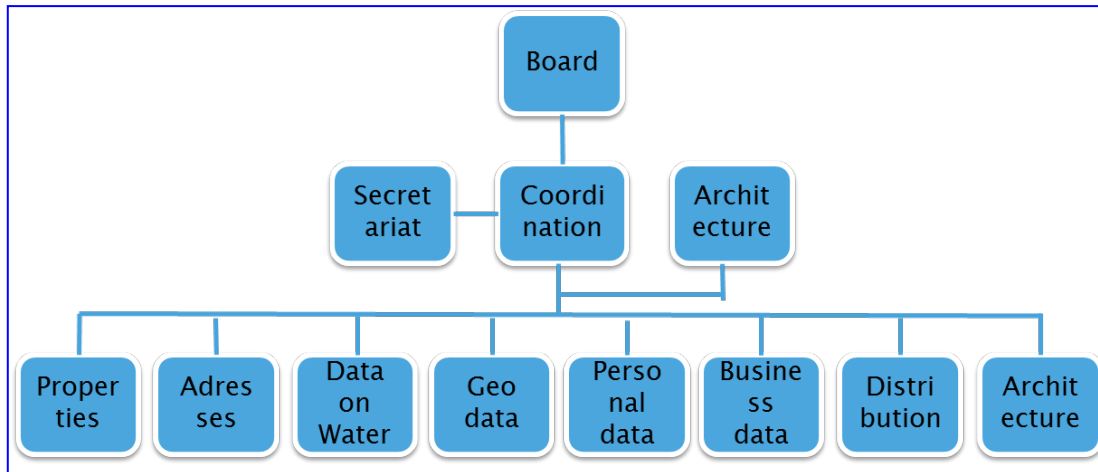
An important improvement with respect to real estate/property occurred when reaching one common definition of real estate/property as opposed to the previously four definitions.

2.2   Improving quality

The project has required a great deal of cooperation between the central government, regions and municipalities with respect to improving the data quality, combining registers, deciding on common names for variables and achieving a common understanding of what a variable implies.

This has so far resulted in the closure of redundant registers and improved and homogeneous rules for historical data. An agreement is to about to be reached regarding the contents of the variables as well as the description of the contents. The consequence will be fewer registers to be updated by the municipalities, which in turn will simplify the administrative process and will undoubtedly contribute to an improved data quality.

Present quality issues:

	Quality issues
1.	**Earlier addresses and registrations**
	An example is that at present a building permission is granted by the municipality and the building of the house can start immediately. The registration of the building in the Register of Buildings and Dwellings and its address can occure some time, after the permission is given. This is for instance a problem for the statistics concerning construction activity. The late registration of the address is a

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[1] It was not because they could not see the benefits, but because they were afraid of losing ownership to specific dataelements. The changes would also mean less funding when registers become more efficient.

| | | problem for anyone who has business at the address, because they can't use a digital navigating system.

In the future the municipalities are obliged to register the building and the address not later than 10 days after the building permission has been granted.

The real estate/property register maintained by the municipalities has been phased out and a common basic registration in a register has been established, which is then re-used by the other registers with the same reference id. At the same time, one of the address registers has been closed. |
|---|---|---|
| *2.* | **Better address in the Business register** | |
| | Approximately 50,000 businesses are located at an address that cannot be found in the new common Address Register. In all cases, except 8, the address is valid at the level of street name and house number, but the floor/unit number may be missing or incorrect.

In future the businesses are responsible for ensuring that they are registered with a valid address, otherwise they will be contacted and asked to provide a valid address by the Danish Business Authority. Possibilities of imposing sanctions have not yet been decided in cases where the address is not updated as asked. This also applies to most of the businesses whose about floor or unit number is missing. Businesses are also responsible for registering correct information in ABR[2] digitally on name, address, industry at the legal unit and likewise at any local units. Furthermore, compulsory information on owners, board members and managers.

Valid addresses for business, legal and local units will mean that it will be easier to use the address as a key/relation between different registers eg. From ABR to BDR. | |
| *3.* | **Better address in the Population register** | |
| | Approximately 8,000 persons will automatically be allocated a new address, a pseudo-removal, as their addresses are invalid. This also applies to most of the businesses whose floor or unit number is missing.

In Denmark, all legal residents are allocated a personal identification number, which follows a person throughout his/her entire life with a few exceptions. The individual is responsible for recording his/her actual address in the Danish population register.

All residents with a CPR-number (personal id) have online access to update and access their own data on a secure platform. | |

2.3 Network-services

The data are made available from common distribution platforms and the so called "Data Distributor", through which the data can be obtained easily and quickly and in a secure manner. The data owner is still the person/authority responsible for the data.

The Data Distributor is a service, which stores a copy of data from all the Basic Data registers. The data are continuously updated.

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[2] https://danishbusinessauthority.dk/ with relation to the (Administrative) Central Business Register (CVR)

The data will be made accessible and free to everyone, i.e. public authorities, businesses and citizens. All users will gain access by using Digital Signature[3]. All users will have access not only access to their own data, but also other data with the exception of certain sensitive data.

When access to data is open to all, it is also necessary to control access to the most sensitive data about individuals and companies. Therefore there exist 5 levels of security for data confidentiality. The highest level and thus the most restrictive includes personal information, such as the person ID and date of birth. Safety level is controlled by the owner of the data in cooperation with the project owner.
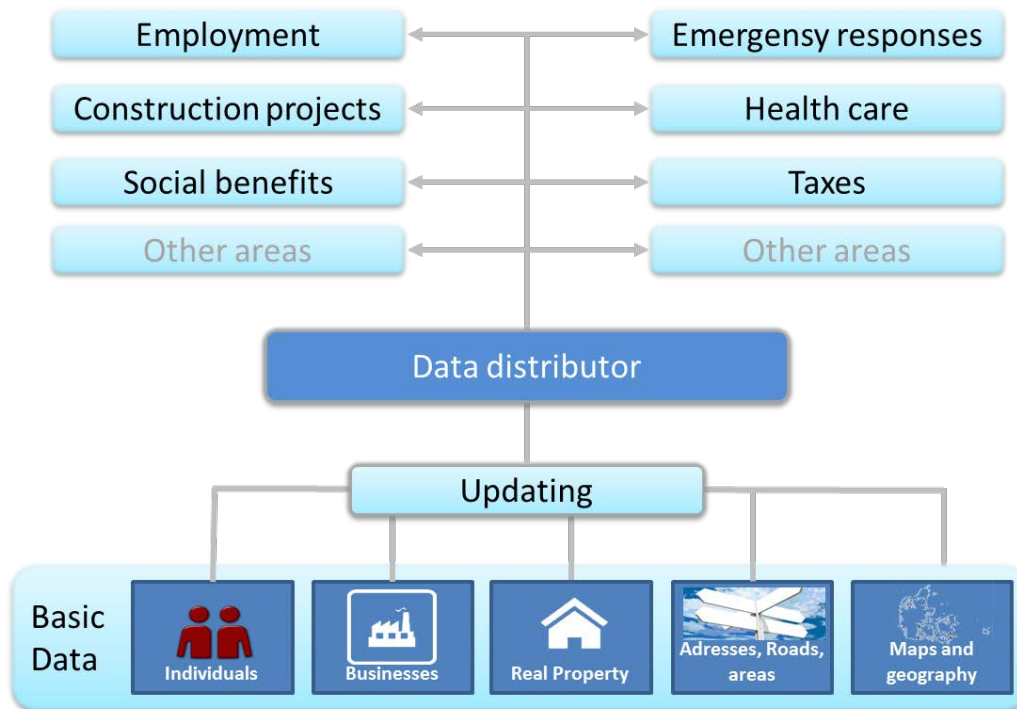
There are strict requirements regarding the data distributor as to where the data are to be stored in order to facilitate the accessibility of data for the users. Consequently, a common set of guidelines has been developed and the data model is established based on a set of common basic quality criteria.

3. Preparation of the program

3.1 Legislation

The Basic Data Programme in Denmark is a political and administrative requirement. The administrative registers are based on Danish legislation. The cooperation is conducted in a rational manner and based on a wish to run the business as cheaply as possible.

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[3] Digital Signature in Denmark is called NemID: NemID is a common secure login on the Internet, whether you are doing your online banking, finding out information from the public authorities or communicating with one of the many businesses that use NemID. (https://www.nemid.nu/dk-en/about_nemid/)

All persons in Denmark are assigned a personal registration number (CPR-number) either at birth or when taking up residence in Denmark. It is a unique number and it will identify the person until his/her death. It is used for identification throughout his/her entire life from kindergarten through the educational system and employment to the grave.

The Administrative Business Register was established on the basis of legislative cooperation between the Danish Tax Authorities, the Danish Business Authority and Statistics Denmark. Starting a business is easy. All it requires is an online registration using a digital signature and 99 pct. of the registrations/applications are approved within 24 hours, and a unique CVR-Number is assigned. The businesses are responsible for maintaining and updating the information regarding their individual activity, address, Tax/VAT. SD is can change the activity code (NACE) if necessary and is the public authority, which undertakes the most corrections in the register.

The real estate/property registers are also based on Danish legislation. Every building and any comprehensive change to an existing building requires a building permit, which has to be registered. All sales of real estate are registered and published. Owners are registered using the CPR-number if a person and CVR-number if a business.

An Address Act has been passed in Denmark, which describes the valid formats. An address is only "legal" if it can be found in Denmark´s Address Register. The Act ensures in addition that all authorities register addresses in the agreed format and only use addresses found in the register.

3.2   Architecture

Data will not be stored by a large part of the public administration. Instead, they will set up API, where they can look up information as required from the Data distributor. Data in the Basic data programe are updated in real-time at the Data distributor. Responsible for the Data distrutor is Agency for Data Supply and Efficiency[4].

 SD will still make full copies of the different administrative registers, but in the future from the data distributor if it's a part of the programe, for the purpose of being able to recreate data. This implies that, dependent on the use, a complete copy can be obtained as required, whether it be monthly, quarterly, bi-annually or annually.

Data kept by SD are stored in Oracle databases, but the data that we extract are in JSON or XML.

3.3   Use of administrative data in Statistics Denmark

Since 1967 SD has had free access to all administrative registers based on legislation. This has been a great advantage to SD and improved the efficiency of the work conducted by SD.

For example, Population censuses can be done in 1 minute, it's possible to follow all citizens/businesses throughout their entire life, e.g. with regard to which education results in which job types or average age distributed by occupation, the only limit is our imagination. One of our most popular statistics is the annual publication of the most popular names given to new-born

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[4] http://sdfe.dk/

children. On our website it is also possible to see statistics on specific names, which are also popular. People like to look up their own names.

Over the years the burden for respondents, especially for businesses, has been reduced. This has been achieved by increasing the use of administrative data.
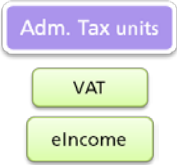
VAT was introduced in 1967 and thereby the first major source to a central business register was born. From the beginning SD had access to administrative registers and in the early 1980´s the first SBR register was set up. The register contained the Danish tax authorities´ registration system combined with information from the corporate registration. SD began already at this stage to compile statistics on the level of administrative legal units with regard to, e.g. employment and several short-term statistics within the area of manufacturing.
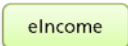
Against this background SD has during many years used a great amount of resources on linking and integrating the different registers. SD has for many years created a SD-number for units such as properties, persons and businesses, which make it possible to maintain the same unit, irrespective of administrative system changes. This also gives us an opportunity to anonymize data on persons in SD.

Administrative registers are used by SD in the following areas: Persons, institutions, education, housing, buildings, addresses, businesses, business owners, earnings (persons and businesses), agricultural areas by type of crops, livestock register.

Since 1981 SD has compiled employment statistics at the level of workplace; at first the statistics were compiled on the basis of annual data, but since 2010 we have been able to receive monthly data. These data, which are called e-Income, are not part of the Basic data, but are shared between the Danish Tax Authorities and SD. All employers have to report the employees earnings to the Tax Authorities at least monthly on LKAU level.

An illustration of part of SD's use of administrative data

Basic Statistical Registers (SD)	Administrative data (TAX)	Administrative data (others)	Basic Data Programme	Others
SBR	Adm. Tax units / VAT / eIncome	ABR		PDP about Groups / EGR / Livest ock R. / Agricul ture R.
GEO			Housing & bu... / The / Property Owners / Property Owners / Real Property / R. for Adresses / Maps	

Basic Statistical Registers (SD)	Administrative data (TAX)	Administrative data (others)	Basic Data Programme	Others
R. for persons	eIncome	Educa-tion	Register for persons	
Various DST systems	Motor Vehicles	Health Register		Livest ock R. Agricul ture R.

3.4   Use of administrative data, citizens and businesses

Administrative registers and re-use of the data they contain is an advantage for both citizens and businesses. There are, of course, some who are afraid for linkage of registers with the risk of abuse and surveillance. However, this fear generally disappeared in Denmark in the 1990's.

The new initiative involving Basic Data opens new possibilities for businesses engaged in research and analysis and is expected to generate income from using these data.

A large part of the population considers it as a great advantage that it is possible to see the valuation of a property as well as the latest sales price of the property. A citizen can change the basic information on his/her dwelling, but not the valuation.

The ABR is publically accessible on the Internet and it is widely used by businesses when checking whether new customers have provided the correct information. Data on name of the business, founder and manager of the business can be obtained as well as information on the size group of employment. Furthermore, the latest annual accounts can be downloaded.

By making data free for all widens the group of stakeholders, who contribute to the improvement of the data quality.

One advantage is that it is possible to compile more statistics at lower cost. This implies that fewer employees are needed by SD and by the public sector as a whole, but it also results in a reduction of the data that citizens and businesses have to report to SD and the other sections of the public sector.

4. Network of Basic Registers in the Netherlands

In the Netherlands a rather similar program as in Denmark has been launched by the Dutch government to improve governmental services for its citizens and its businesses. The Dutch developed a Network Of Basic Registers as part of a Generic Digital Infrastructure. Detailed information about this Network is described in the Dutch paper of Rico Konen from the business register department at statistics Netherlands. His paper can be consulted as part of the 25th Meeting of the Wiesbaden Group on Business Registers, Session 3 Administrative Data/Agencies/Units.

Topic	Denmark	Netherlands
Strategy on e-Government	http://www.digst.dk/	https://www.digitaleoverheid.nl/
Basic Registrations	http://www.digst.dk/Servicemenu/English/Digitisation/Basic-Data http://grunddata.dk/	https://www.digitaleoverheid.nl/onderwerpen/stelselinformatiepunt/stelsel-van-basisregistraties\
Portal for citizens	https://www.borger.dk/Sider/default.aspx	MijnOverheid.nl
Digital signature	http://www.digst.dk/Servicemenu/English/Digitisation/Digital-Signature/Next-Generation-Digital-Signature	https://www.digid.nl/ https://www.eherkenning.nl/