Open Government Data – A Key Element in the Digital Society

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Abstract. During the last decade several initiatives have worked towards open and freely available data. First, the success by the OpenStreetMap and partly the free use of Google Maps have been a revelation for many users, both in the public sector as well as in the private sector. Additionally, several legal frameworks like the EU directive on Re-use of Public Sector Information and the INSPIRE Directive on geographic information have in various ways encouraged the re-use of public sector information. As a consequence, a minor group of European countries have launched their own open government data projects, and the current research focuses on the role of open public sector information as a major step towards a digital society by analysing the background, extent and expected impact of the Danish open government data initiative.

Keywords: Spatial Data Infrastructure, Open Government Data, Public sector information.

1 Introduction

Data sharing is a fundamental component of the modern digital societies, and easier access to data and information has been a vision since the early days of the information society. However, very little progress has been achieved in this field until quite recently, and the success of the free OpenStreetMap is perhaps the best positive example on a worldwide solution on data sharing. Due to its extensive use, Google Maps also share this success although the use of data is imposed some restrictions. Generally there is a growing tendency to release at least to some degree various sorts of public data allowing citizens and businesses to freely re-use public data for their own purposes [1]. The real driver towards free sharing of data and information comes from the government sectors, including the European Union. Thus the launch of the so-called Digital Agenda of the European Union [2] has emphasised the need for maximising the economic and social benefits of Information and Communication Technology (ICT) towards a sustainable future.

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Large amounts of data and information are daily produced by the European public authorities being the largest single source of information in Europe with an estimated market value of 32 billion Euros.

Open government data has received increasing awareness during the last ten years in parallel with the preparation and implementation of the INSPIRE Directive [3]. Traditionally geographic information in Europe has been financed through the so-called cost recovery principle, where the revenue obtained by selling data is used for updating the data and maintaining the data quality. However this model has been under pressure from the EU by the PSI and INSPIRE Directives although the cost recovery is not directly in conflict with this legislation.

Several European countries have initiated open government data in various extents. Last autumn the Danish Government decided a new initiative on Basic Data, which is considered an essential basis for public authorities to perform tasks properly and efficiently across units and sectors, as outlined in the Danish e-Government Strategy 2011-2015. The vision is that Basic Data is to be the high-quality authoritative common foundation for public sector information – including the private sector. A general principle is that all basic data will be freely available for all public authorities, private businesses and the individual citizens.

The aim of the current research has been to analyse the background, extent and expected impact of the Danish decision on opening up government data for free re-use as a step towards the implementation of the digital society. After this introduction follows a chapter describing the background and theoretical foundation for the tendency towards open government data. The third chapter describes and analyses the national Danish implementation of open governmental data. Chapter four analyses the Danish approach to open data. The paper ends with a discussion and some concluding remarks including perspectives for subsequent research.

2 Background and Theory

The EU Digital Agenda is the first of seven so-called flagship initiatives included in the Europe 2020 Strategy presented in May 2010 [2]. The aim of the Digital Agenda is that Europe's citizens and businesses should get maximum benefit from the digital technologies. The Digital Agenda contains 101 actions organised into 7 pillars: 1) Digital Single Market, 2) Interoperability and Standards, 3) Thrust and security, 4) Fast and Ultra-fast Internet access, 5) Research and innovation, 6) Enhancing digital literacy, skills and inclusion, and 7) ICT-enabled benefits for the EU society. One of the actions (no. 3) within the Pillar 1: Digital Single Market are concerned with opening up public data resources for re-use. Already back in the 2003 the Directive on Re-use of Public Sector Information aimed at regulating and stimulating the reuse of public sector information (PSI). Although the PSI Directive [4] deals with all kinds of public sector information, a majority of this information has a geographical reference. Thus the focus for public sector is to manage and service people, businesses, real properties, roads and areas, which all are located somewhere on the surface of the earth.

2.1 Data Sharing in the Digital Society

The issue of data sharing goes back to the 1990es, where the book 'Sharing Geographic Information' [5] explored organisational issues in the context of sharing geographic information. Herein Campbell and Masser [6] concluded that within the UK local governments very little data sharing took place even between departments. Paper maps were still at that time a major source to information. However during the last 10 – 15 years the development towards a digital society has really put data sharing on the political agenda. However, the principle of data sharing is not enough to ensure an open, transparent and efficient public sector. Frequently bottlenecks connected with costs, legal restrictions, and proprietary data formats have hindered real re-use of data for the benefits of the society.

Globally the value of data sharing and free data has been demonstrated by the emergent free map services like Google Maps and not at least the OpenStreetMap, which have put severe pressure on the National Mapping Agencies. Surveys have demonstrated that not only the citizens and smaller private companies are using these map services, but also public organisations like agencies and municipalities. However, the most important reason for the recent focus on Open Government Data is the implementation of digital governance with extended use of self-service solutions. This requires access to data and information across the public sector – from municipalities over regional authorities to the national governments.

According to the recently started 'Open Government Data' initiative (http://www.opengovernmentdata.org) 'open data' means 'data free for anyone to use, re-use and re-distribute', and 'government data' refers to 'data and information produced or commissioned by government or government controlled entities'. This definition is applied in the current paper. The 'Open Government Data' initiative has produced a handbook aiming at supporting implementation of open government data around the world, and at the same time building a common framework for assessing existing open government initiatives. The Open Data Handbook [7] points to several areas, where open government data may create additional value including: a) Transparency and democratic control, b) Public participation, c) Self-empowerment, d) Improved or new private products and services, e) Innovation, f) Improved efficiency and effectiveness of government services, g) Impact measurement of policies, and h) New knowledge from combined data sources and patterns in large data volumes. These advantages can be organised into two main groups. One group (items a – c) can contribute to enhanced democracy and participation, while the other group (items d – g) primarily focuses on the economic benefits obtained through more efficient public sector and improved innovation and business possibilities in the private sector.

In order to discuss open government data some clear definitions must be stated, and several attempts have been made in this connection. Through a consensus process among 30 experts within this topic in December 2007 the 'Open Government Data' initiative has defined a set of principles, which must be met to be compliant with the open government data definition (table 1). In addition to the eight principles, a criteria

'Compliance must be reviewable' was defined by the 'Open Government Data' initiative. These principles have no authoritative role or legal bindings, but may serve as guidelines and inspiration for emergent open data initiatives, and will be applied in the analysis of the Danish implementation in chapter 3. Furthermore, the principles are all considered of equal importance, which are not true in practice. However, as shown in the section below the principles are to a large degree contained in the PSI and INSPIRE directives.

Regarding open government data it is clear, that open data is not the same as free data applying a strict definition of the word 'free'. All government data are produced by the public employed or bought from private companies and the associated costs are fully paid by the taxpayers. Thus, it may be argued that without a principle of free re-use, the taxpayers have to pay for the data twice.

2.2 European Legal Frameworks on Open Government Data

The PSI Directive [4] was implemented in July 2005 aiming at regulating and stimulating the reuse of public sector information. The initial intention of the European Commission was to make all public sector information in the Member States available for re-use. However, this caused some Member States and public institutions great concerns, as many of these institutions are expected to provide for, at least parts of, their own funding. Therefore, in the negotiation process between the European Parliament and the Council the general principle was toned down to a mere encouragement for the Member States to make their information available for re-use. Nevertheless, the PSI directive has gained a lot of impacts in the Member States as demonstrated in the next paragraph.

A key objective of INSPIRE was to make more and better spatial information available for Community policy-making and implementation in a wide range of sectors. Initially, it would focus on information needed to monitor and improve the state of the environment - including air, water, soil, and natural landscape - and later extended to other sectors such as agriculture and transport [8]. The INSPIRE Directive was adopted by the European Council and Parliament in spring 2007 and entered into force May 2007 [3]. The INSPIRE Directive is a framework, where the details are defined through a set of so-called implementing rules, where the Member States provide experts for drafting the rules, which are finally adopted by the INSPIRE Committee. Thus a high degree of Member States involvement is ensured. In a national Danish context, the so-called Geodata Law was a derived effect of the INSPIRE Directive. The INSPIRE Directive relies on a set of basic principles of which the one on data availability and accessibility 'Spatial data needed for good governance should be available on conditions that are not restricting its extensive use' is of major importance regarding open government data.

Altogether, there were several reasons and encouragements for opening up public sector information in a broader scale among the European countries. As an example, the next section will describe the Danish approach to Open Government Data.

Table 1. The principles of Open Government Data (http://opengovdata.org)

1. Data must be complete	All public data which are not subject to valid privacy or security limitations
2. Data must be primary	Published as collected at the source with finest level of granularity
3. Data must be timely	Made available as quickly as necessary to preserve the value of data
4. Data must be accessible	Available to widest range of users and purposes
5. Data must be machine processable	Reasonably structures to allow automatic processing
6. Access must be non-discriminatory	Available to anyone without registration requirement
7. Data formats must be non-proprietory	Available in formats over which no entity has exclusive control
8. Data must be license free	Not subject to any copyright, patent, trademark or trade secret regulation
Compliance must be reviewable	A contact person must be designated to respond to user requests

3 Implementation Strategy

Similar to the other Nordic countries, Denmark has a leading role in digitisation of the society. In the 2012 United Nations E-Government Surveys rankings, Denmark is ranked in the top as number four after the Republic of Korea, the Netherlands and the United Kingdom [9]. E-Government is generally being defined as the use of information and communication technologies (ICT) to improve the activities of public sector organisations and their agents and e-Government has been the key driver for all activities regarding information and communication technology in the public sector.

Since the mid-1990es various Danish governments have put e-Government on the political agenda with initiatives like "Information Society by the year 2000" [10] and not at least “Project Digital Government” [11], which sat up a so-called Digital Task Force aiming at enhancing e-Government solutions across the public sector.

To underline the importance of the Digital Task Force the Ministry of Finance chaired it. The Danish e-Government strategy for 2007-2010, entitled "Towards better digital services, increasing efficiency and stronger cooperation" (Danish Government, Local Government Denmark and Danish Regions, 2007) has three overarching strategic priority areas: a) better digital service, b) increased efficiency, and c) stronger collaboration. The national SDI is one of the prerequisites for fulfilling the strategy and handling the new dependencies. This policy was followed by an updated strategy concerning the period 2011-2015 [12].

3.1 The Stepwise Approach to Open Government Data

Generally access to and re-use of public sector information has been imposed with high costs and severe restrictions. However, several steps towards open government data have been launched during the last ten years. The *first* step towards Open Government Data in Denmark was the decision taken by the Ministry of Environment in the late nineties to make open access to all environmental information. This was a natural consequence of the Aarhus Convention from 1998 [13] emphasising the importance of public participation in all decisions related to the environment, which requires access to data and information. Thus open access to government data is addressed in Directive 90/313/EEC of 7 June 1990 [14] by stating the aims of 'ensuring freedom of access to, and dissemination of information on the environment held by public authorities and to set out the basic terms and conditions on which such information should be made available'.

The *second* step was the open access to the Address Register and Building and Dwelling Register in 2002. The decision gave open access to the data, and in principle the data was 'free', but only through a set of private distributors, who required rather high delivery costs. Thus the profit from selling and delivering the data was transferred from the public authorities to private companies. Nevertheless, the price for acquiring the Building and Dwelling Register including the Address Register was significantly cheaper than before, and the result was a substantial increase in the number of users.

Following the two INSPIRE principles of 'Data should be collected once and maintained where this can be done most effectively' and 'It should be possible for information collected at one level to be shared between all the different levels', an agreement between the Danish national Geodata Agency and Local Government Denmark was made in 2007 [15]. This so-called FOT-Denmark aims to establish a national base map for use at all administrative levels by combining the nationwide topographical database with a specified accuracy of 1 meter, and large-scale technical maps with an accuracy requirement of 10-20 cm used by the municipalities. Currently all municipalities have joined FOT-Denmark, and in 2012 the Geodata Agency acquired full rights to the FOT database.

The FOT-Denmark cooperation facilitated the *third* step by inventing a new funding model for geographic information. Traditionally, the Danish funding model for geographic data has been partly based on government funding and partly by cost recovery, but from 2009 a new funding model was launched for the central

government sector. All ministries pay an annual fee to the National Mapping Agency, and in return all the central government agencies and institutions have access to the spatial data and services. Later in 2010, a similar agreement was obtained with the Local Government Denmark providing a free flow of geographic data among public authorities. However, the use of data was still imposed by several restrictions – e.g. publishing even derived data on the Internet.

The three steps mentioned above all focused on different sectors without being planned and implemented as part of an overall strategic vision. Nevertheless these steps represent important building stones in the Danish Infrastructure for geographic information as described and analysed by Hansen et al. [16]. From a governmental point of view a spatial data infrastructure is seen as an important dimension in several e-Government initiatives. Thus the Digital Task Force recognises the importance of geographic information by claiming that for many public authorities, the combination of geographic location and other registers or databases has proved a valuable tool in a number of administrative tasks. Recently, the Digital Task Force even stated that geographic information is a backbone in e-Government [17].

Although the initiatives taken during the first three steps, the visions of an advanced e-Society with extensive use of self-service solutions in the public sector are counteracted by several bottlenecks. Accordingly, the *fourth* step is a significant move towards extensive open government data. From 1 January 2013 several important registers and all terrestrial geographic data – i.e. topographic data, the Danish digital elevation model, and the cadastral map are freely available, and during the next months more data from the public registers will be made freely available in form of what is called basic Data [18].

3.2 The Basic Data Concept

By using a common geographic basis for administration, it is possible for example to link relevant data about the environment, traffic, health, property, companies and people. Basic data constitutes the core information needed by public authorities in their daily work, and contains information about *Persons*, *Businesses*, *Real properties*, *Addresses*, *Roads* and *Areas*. All these data has a spatial reference, and accordingly geography and maps are important elements in the Basic data concept (fig. 1). This figure illustrates clearly the interconnection between the different components of the Basic Data set. Each person, business unit, property, house and road has for decades been provided with unique identifiers, and a cross-reference register has ensured the interconnection between the different objects in the infrastructure. Besides, all persons and business units are assigned an address. Finally, the addresses, properties (parcels) and buildings are assigned a geographic reference, ensuring its connection with geography (maps). Thus the basic Data set constitutes an integrated system facilitating the core functions in public administrations.

At a later stage in the process it is expected to expand the Basic Data set to include personal data, income data, business financial statements, and road infrastructures. In order to maintain the authoritative status required for public administration, management and decision-making, the Basic Data needs to comply with the following

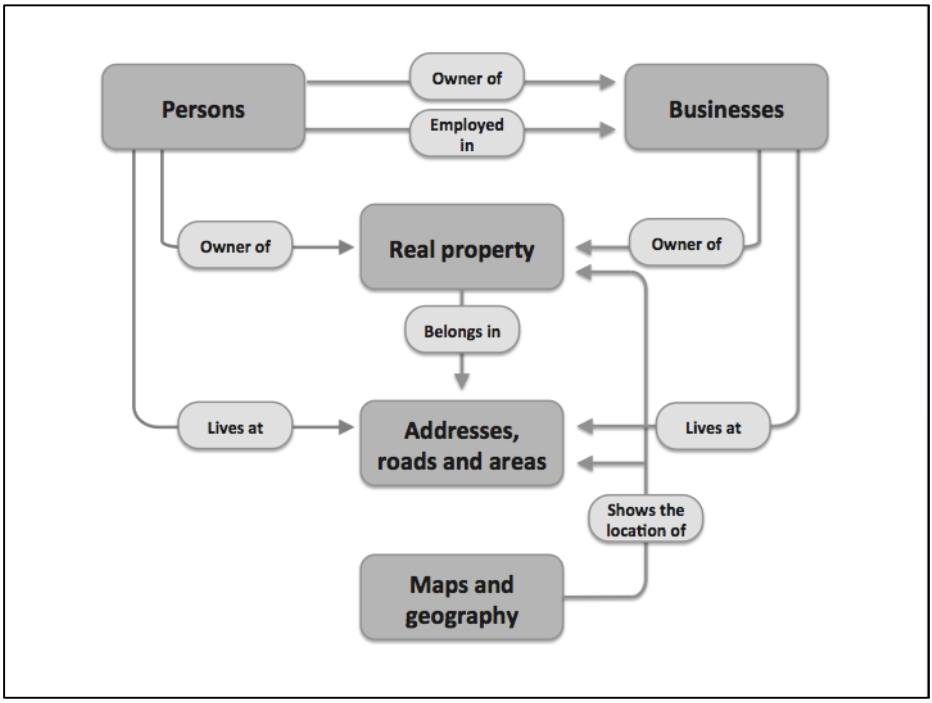

Fig. 1. The Basic Data concept in the Danish Open Government Data Strategy

principles: 1) Basic Data needs to be as correct, complete, and up-to-data as possible; 2) All public authorities must use the Basic Data in their daily work; 3) As far as possible Basic Data must be made freely available to businesses as well as the public (sensitive personal data excluded); 4) Basic Data must be distributed efficiently and accommodate the needs of the users.

In order to produce, maintain, and ensure data quality a specific business model has been developed. The Danish National Government and the organisation of local authorities – Local Government Denmark – have agreed to share the costs of Basic Data through a mutual agreement. Particularly in the first phase of the implementation additional costs for setting up facilities for data distribution, the costs may balance the benefits, but based on previous experiences from making address data freely available, the Danish Ministry of Finance has estimated that a revenue of more than 100 million Euro is expected when the Basic Data initiative is fully implemented by 2020. One third of this is expected from a more efficient public sector, and two-thirds from the private sector through enhanced innovation and competitiveness.

3.3 Cost-Benefit and Expected Impact

During the last twenty years major discussions have taken place regarding the benefits versus costs of various initiatives on the digitisation of the society based on establishing spatial data infrastructures and providing public data open and freely available. Few studies have tried to estimate the costs and benefits connected with

such initiatives but rather few really cost-benefit analyses. However a survey carried out in the Netherlands estimate the economic value of the Dutch geoinformation sector to be 1.4 billion Euros – corresponding to 0.25% of the national Dutch GNP [19]. During the 1990es the national Danish Address Register went through a major harmonisation and quality upgrade, and from 2002 the Address Register including addresses coordinates was made open and free to use for everybody [20]. An analysis from 2010 concluded that the direct benefits from the open and free access to the Address Register in the five years period from 2005 – 2009 were more than 60 million € [21]. The analysis assumes that the economic value of the open and free addresses corresponds to the price paid by the users of addresses before the new open policy on address data, which is equivalent to 78 million €. These figures may even represent an underestimation due to the wider scope for use in the new agreement, where everyone may add value to the data and sell them for profit aims. On the other side you may claim that the general movements towards the digital society, inevitably would have led to lower prices on address data. In order to reduce the uncertainty in the analysis the value of address data is reduced with 25% - i.e. (75% x 78 million €) = 59 million €. Contrary, the authorities as well as the users have saved thousands of person hours earlier spend on negotiations, agreements, and data delivery, and in the calculations these savings are estimated to be 5 million €. This adds to 64 million € for the years 2005-2009 – and 13 million € yearly. However these figures do not include indirect and derived benefits obtained from: a) no need for alternative address data sets; b) higher security for police, ambulances, fire brigades etc. due to the same and accurate address data set.

Based on these figures, the Danish Ministry of Finance tried to estimate the costs and benefits from the new initiative on open public data at the broader scale. When the new Open Government Data policy is completely in operation in 2020, it is expected that the public sector yearly will save about 36 million € (table 2), and for the private sector the yearly benefits will be more than 65 million €. Thus the total yearly economic benefits for the Danish society will be about 100 million €. Although Basic data is freely available for everyone, the cost of producing the data is still there. As mentioned above the funding of the open government data project is based on shared costs between the different administrative layers in the Danish public sector. The expected benefits are more uncertain, but the calculations carried out by the Ministry of Finance are based on recent cost/benefit studies from Finland and Australia, and generally the estimates are conservative. Based on experiences from Australia, Houghton [22] concludes that 'the direct and measureable benefits of making PSI available freely and without restrictions on use typically outweigh the costs. As framework for estimating cost-benefits Houghton used the following formula: 'Benefit/Cost' = ('Agency & User Savings' + Increased Returns to Expenditure on PSI production') / 'Agency & Users Cost'. This formula was also applied in the cost-benefit analysis carried out by the Ministry of Finance. The Research Institute of Finnish Economy carried a major analysis on the impact of the pricing of public sector information on performance in the business sector, and based on data from 15 countries during the years 2000-2007 it was found that pricing of PSI

really had an effect on company growth - particularly for small and medium sized enterprises [23]. Although the figures varies from country to country it was found that for example free access to geographic information contributes to a 15% higher growth rate (on average) compared with traditional pricing based on the cost recovery principle.

Table 2. Net profit for the public sector in millions € [18].

	2013	2014	2015	2016	2017	2018	2019	2020
The Ministries	-14	-11	-7	-3	1	1	4	6
The Municipalities	-3	3	11	19	22	23	23	24
The Region	0	1	3	4	6	6	6	6
Net effect	-17	-7	7	20	29	30	33	36

4 Analysis and Discussion

The principles outlined by the Open Government Data initiative (table 1) will be applied as a discussion frame for the Danish approach to open government data. Besides, the Danish approach will be assessed in relation to overall strategic aims. The nine principles identified by the Open Government Data initiative considers all principles of equal weight although some kind of weighting may have improved the appropriateness of using the principles as framework for the analysis. However, assigning weights to the principles is a major task beyond the focus of the current research, and accordingly the weights are considered equal in the discussion below:

1. Data must be complete: Although the Danish initiative is one of the most encompassing open government data projects as it covers all terrestrial geographic data, addresses, data on buildings, properties, and businesses as well as individuals unless the data is confidential personal information, a lot of data belonging to Statistics Denmark are still only available on commercial conditions. Clearly, it can be discussed if data from Statistics Denmark belongs to the group of public sector information.
2. Data must be primary: All data included in the new open government data policy are available as originally collected by the authority and with the finest granularity. Thus the data are not aggregated in any way.
3. Data must be timely: As soon as the new data distribution facility is in operation by summer 2013 the data for download or available as services will be the latest version used in the public administration.
4. Data must be accessible: The data will be available for public authorities, private companies and individuals for all purposes – including commercial aims. Thus no restrictions for legal use.
5. Data must be machine processable: The data are all well structured according to the current state-of-the-art methods, and all details about the underlying data models are freely accessible by download in order to serve the users

post-processing and applications. Metadata following the latest ISO standards are provided for all data within the Basic Data set.

6. Access must be non-discriminatory: The data can be downloaded by anyone without any registration, but currently the new data distribution portal is not in operation, and therefore it is unclear if some kind of registration will be required.
7. Data formats must be non-proprietary: The data is available in XML-formats, and other international standards including Web Feature Services, Web Map Services as well as industry standards like shape files from ESRI and Excel from Microsoft, and more.
8. Data must be license free: There are no regulations, patents or similar restrictions, but it is expected that the users mention the data source and attach the associated metadata. However, besides being free the final conditions are still not clear.

   Compliance must be reviewable: Contact persons are currently available for the individual parts of the Basic Data set, but it is still unknown if the new data distributor unit will serve as a common contact point, when the data distribution portal are in operation later this year.

Summarising the analysis above the Danish approach to open government data seems to be highly compliant with the 8 principles developed by 'Open Government Data' from 'Open Knowledge Foundation'. However, two dimensions have to be discussed. First, the new open data policy in Denmark is still under implementation, and although you can at the moment download all the data belonging to the Basic Data set without any restrictions the final conditions, except data being open, are still uncertain. Therefore, an exact conclusion on being compliant with the eight Open Government Data principles is associated with uncertainty. The second issue is related to the lack of priority within the nine principles. Looking at the nine principles from top to bottom gives in our opinion some kind of priority. Thus the first 4 items seems to be of more fundamental importance than the remaining 5. For example this does not mean that the use of non-proprietary data formats (7) and registration requirements (6) are not important, but they do not possess the same kind of fundamentality than for example data being primary (2) and accessible for all users and purposes (4). Considered in this light the Danish Open Government Data project seems to be highly in accordance with the core principles (1 – 4) from the Open Government Data initiative.

The Danish OGD project is a result of a top-down effort initiated by the Ministry of Finance based on purely financial considerations and cost-benefit calculations. During the previous ten years many partners involved in handling geographic information and associated public register have worked on setting up an Infrastructure for Spatial Information in Denmark as described by Hansen et al. [16] but without any power to launch a process towards open public information like the one described above. Only the top ministers including the minister of finance have the necessary power to do this.

A concern often put forward in the discussion of open government data is related to the costs of maintaining and updating the data. Who should pay, when the public data is open and according to the definition 'freely' available to anyone? The public registers are being produced and updated through the day-to-day work in the public agencies regarding the administration of persons, properties, buildings, businesses, etc., and accordingly there are no additional costs associated with their production and maintenance. However, some public organisation may loose income from selling register data to the private sector, and although the amount of money is rather low compared to the total public budgets, this income is of importance for some specific departments.

Concerning geographical data (digital maps) the so-called cost-recovery model has been the traditional economic foundation for production and maintenance. The geographic data have had a group of stabile customers like the Ministry of Defence and the Ministry of the Environment, and then ad hoc sales to other public organisations and in minor degree to the private sector. Hence, the new open government strategy will have a major impact on the economic model for the operation of the National Mapping Agency. As mentioned above the lack of income from selling geographical data will be compensated by direct economic support from the National Government, the Danish Regions, and Local Government Denmark – at least on the shorter term (2 – 3 years). The long-term funding of the digital maps remains to be decided. In addition the Ministry of Finance has decided a continuous 2% yearly cut of the public budgets due to increased effectiveness in the public sector. Finally, a continuing of the European economic and financial crisis will inevitably put the public budgets under renewed pressure, which indirectly may lead the lower data quality. Therefore, many fears that the geographical data will suffer from lack of update and quality control. However, one of the main arguments for making the decision on open government data was a more effective public sector and a more innovative and competitive private sector, and these aims will be strong drivers for providing up-to-date and high quality open public data.

The visions on getting public data re-used among citizens and in the private sector has recently been analysed by Bjoern-Moeldrup and Colding [24]. Until 1 January 2013 the Danish National Map Supply operated by the Geodata Agency had about 800 registered users, but this figure was enhanced to about 4000 registered users of the Map Supply by 1 April 2013. Within the same period the number of downloaded data sets has increased from less than 1000 thousend more than 15000. A majority of the new users (62%) are citizens, while 28% are private businesses, but the latter has made most of the downloads.

Thus an immediate effect of the Danish open government data initiative is promising, but the next interested aspect concerns the use of the data. Does the enhanced interest for public data among ordinary citizens mean increasing interest to being involved in participatory processes, and empowering new groups of people in the public participation? As shown by Hansen and Reinau [25], this is still a major challenge for the public authorities. Although many analyses have shown the great potentials for increased innovation and effectiveness [22, 23], and the demonstrated huge interest for the open government data is a fact [24], it still has to be proven that

the potential will be realised in practice. Open government data is just one factor for innovation. Highly skilled specialists and researchers, entrepreneurship, and venture capital are perhaps more important.

5 Conclusion

During the last decade several initiatives have worked towards open data. Particularly, the success by the open and free OpenStreetMap and Google Maps with few use restrictions have challenged the traditional pricing model based on cost-recovery of the national mapping agencies. Additionally, several legal frameworks like the EU directive on Re-use of Public Sector Information and the INSPIRE Directive on geographic information have in various ways encouraged to opening up free re-use of public sector information. Also the Open Government Data initiative from Open Knowledge Foundation has been a driver towards open government data. As a consequence a minor group of European countries have launched their own open government data projects. The current research has focused on the role of open public sector information as a major step towards a digital society by analysing the background, extent and expected impact of the Danish open government data initiative. The Danish project is rather new being from 1 January 2013 and some details are still unclear. However, it can be concluded that by having the Ministry of Finance with high power and legitimacy as the main driver for the planning and implementation the decision-making process is easier than the previous efforts on establishing a Danish national infrastructure for geographic information. The Danish open government data decision is entirely based on a wish to increase the efficiency in the public sector and as a parallel effect stimulating innovation and growth in the private sector. The next steps in our research on open government data is a comparative analysis of the open government data implementations in 6 European countries in order to identify best practices.

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