The Structural Adoption of Open Data in Governmental Organisations: Technology and Organisation in Practice

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Abstract: This article describes the growth of open government, open data and the means for transparency and accountability but aims to reflect on the bottlenecks and actual practicality of opening data to the public domain by two governmental bodies. The Municipality of The Hague and The Province of South-Holland of The Netherlands are part of 2 research programmes called ‘Government of the Future’, it’s main goals are to explore and establish knowledge on societal innovation by new applications and possibilities of long term effects of ICT’s in the public sector. Part of these programmes are themes as transparency and open data, which are viewed form the somewhat pragmatic and operational side of its applicability. The paper shows the development within the governmental bodies and captivates the ‘readiness’ for open data.

Keywords: Open government, open data, GEO data, governmental bodies, practice

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Introduction

Today more and more governmental bodies encounter the effects of open government policies and transparency issues. Previous studies have shown the rise of a digital government (Scientific Council of Government Policy, 2011) and the need for frameworks in order to practically structure these developments into services rendered by governmental bodies (Mulder & Hartog, 2013) as a consequence for e-government and e-democracy developments. Open government and open data tends to focus on the purpose for transparency. But the dominating discussions surrounding open data seems to concentrate on reusage of so-called Public
Sector Information (PSI) and which parties should or could be involved (Henninger, 2013). Due to not knowing these terms of reusage as such, the practical implicity and applicability is somewhat ambigues.

The economic benefits from and by the use of open data as well as valueing the ecomocial和社会 accountable effects are researched and argumentated in many studies (e.g. Longo 2011; McClean, 2011; Meijer, 2013; O'Reilly, 2010; Pollock, 2009; Uhlir, 2009; Vickery, 2011, De Vries et al., 2011). All of them seemed to share the same notice of ambiguity or misinterpreting the grandeur of open data as rescue means for disclosure of PSI in order to achieve transparency.

In contrast previous studies (Halonen, 2012; Heald, 2006, 2012; Janssen, 2012; Pina et al, 2010) showed openness discussed in line with the mere expectations for transparency and accountability of the government as a necessity. Ever since Perritt wrote on open government in 1997 many directions have been noticeable in the fields of administrative sciences. Openness has been hard to describe, thus many directions (e.g. economical and legal) where needed to assertain scientific and practical knowledge.

Some recent studies have shown a shifting attitude of the public in regard of perceiving openness or transparency by governmental bodies. The open data movement – or as Henninger (2012:85) stipulates ‘two-way online transparency’ – is seen enabling a participative writing society instead of a reading society (Henninger, 2013; Halonen, 2012). Which implies co-creation and participation could be achieved when communicating PSI with the public.

A different element of difficulty for open data can be seen in the changing formats for collaborations within the public sector (e.g. public-private partnerships). Before any data can be disclosed discussions grow on legal issues. In addition Gurstein (2011) mentions a ‘data divide’ in the process of public access which tend to only reach the technical elites, those better able to use and analyse the data. In addition Fioretti (2012) also challenges the interpretation of raw data by citizens. Lundqvist (2011) argues the specific role government should choose in disclosing data; does it just give data or should it also enable the development of applications or websites? Whilst others reflect on the effects of openness and open data on the trust in the government by citizens (e.g. Bannister & Connolly, 2011; Fairbank, 2005; Grimmelikhuijsen, 2012; Hood & Heald, 2006; O'Hara, 2012; Meijer, 2009; Rana et al., 2013) some research focuses on the lack of technical applicability and the publication process of open data (e.g.; Zuiderwijk and Janssen, 2013).

Other ideas of openness and open data involves the positive effects on citizen empowerment, government processes (Meijer, 2013; O'Hara, 2012). Paled (2013) mentioned the effectiveness to improve decision making and services to citizens. In practice we can agree with Halonen:

“Open data is applied in various ways with lots of small-scale success stories available, mostly in the form of mobile-phone or web applications. These apps and websites – as innovative and useful as they are – are yet not the key issue when addressing the overall value of open data. These services make everyday life of citizens a tiny bit easier ...” (Halonen, 2012, p. 9).

This notion is in line with this paper which is based on several explorations in 2012 and 2013 within 2 research programmes in collaboration with the Municipality of The Hague (2012-2014) and the Province of South-Holland (2013-2015) of the Netherlands. In order to assess the possibilities for a structural and practical approach of open data within aforementioned organisations several semi-structured interviews with key experts (CIO's, legal representatives, senior GEO staff), civil servants (data source holders) and policymakers. This paper does not specify the digital government nor the economic or legal implications of open data but aims to...
create insight in the reality of adapting open data, more specific GEO data, as structural part of the organisation within two large governmental bodies. We intent to draw the lessons learned for further research on realising open data on an operational level. We orientated on (locational) GEO services and data due to the fact these (regional) data are quit extensive and used for many public services within local governments as well as provinces.

**Open Government**

With the rise of e-government and e-democracy solutions governments have been assessing a certain stability in relating services and policy to the needs of citizens (Pina et al., 2010). Some studies focused on the power of social software (Fischer et al., 2011). As Harrison et al. (2012) points out:

"The idea of using new technologies to support, expand, or re-invigorate democratic practices is not novel. The history of 20th century media has demonstrated that the introduction of new communication technologies routinely gives rise to intense speculation about their impact on the processes and practices of democracy ..." (Harrison et al., 2012, p. 85).

Efforts of e-democracy to engage citizens in participation and structural e-government solutions for online government services have now resolved more or less in open technologies involving sharing data over the internet, resulting in the term and object of study 'open government data' (Yu & Robinson, 2012). As previously mentioned PSI and the public disclosure of data is hard to match one on one for accountablility or transparency (2012:178). Yu & Robinson also mention that vagueness of 'open government'. They stipulate on the notion of separating technological from political openness—separating the ideal of adaptable data from that of accountable politics—will make both ideals easier to achieve. In order for public servants to more readily embrace open data and realize the full range of its benefits, contentious politics of accountability should be separated (2012:208).

Since Obama mentioned the openness of government in 2009 as one of the pilars of his administration many initiatives have been deployed for a sustainable approach. The Netherlands is a member of Open Government Partnership (OGP) initiative. OGP aims amongst others to secure concrete committments from governments to their citizenry to promote transparency and empower citizens (OGP, 2012). Every partner / country is expected to declare their endorsement on open government and form concrete action plans. The Ministry of Interior and Kingdom Relations is responsible for the Dutch action plan. On of the main goals of this action plan is to advocate a transparent government and an active availability of PSI (2013a:10-15). In order to do so many sub-actions and terms of refinement as well as milestones are defined. One of them is the framework of providing open data, which should be based on the Law Market and Government and the new guideline for re-use of PSI (2013a:11). This main goal is in line with a earlier exploratory report of the Council for Public Management concerning the possibilites of openness and open governmental data (Rob, 2012). In 2013 The Ministry also presented a vision on 'Open Government' mentioning open data as an explicit medium to create transparency (2013b). The core elements of an open government is considered to be: a transparent, facilitating, accessible and reliable government (2013b:8-9).

The European Commission also considers open data as a powerful tool in engaging citizens and adding value to data. It provides a framework in order to accomplish opening data (EC, 2011). The
Dutch Ministry responded by providing 5 steps for Provinces and Local Governments to realise open data (https://data.overheid.nl/handreiking, 2014):

- Step 1, how to organise open data as a start
- Step 2, selection of data sets
- Step 3, legal check
- Step 4, organise the publication process
- Step 5, make data findable and accessible

In the everyday life of governmental bodies as a Province of Local Government there are a lot of formats, frameworks and Laws to take into consideration when opening up data. In the practice of open data legal issues rise to the occasion when discussing openness. The Data Protection Act and Freedom of information act have regulated the importance of making data sets available since 1991, especially concerning privacy. The last Act aims to create the possibility to assess governmental bodies on good governance. This is a reactive process where government often make great efforts to provide information adequately. With current internet and ICT developments it has come increasingly easier to publish data on beforehand.

**Open Data**

The effective use of open data is a difficult subject to assess. The drive towards increased public transparency and allowing for enhanced data–enriched citizen/public engagement in policy and other analysis and assessment is certainly a very positive outcome, but open data and its usage is hard to define (Gurstein, 2011). Gurstein and Halonen are two authors who believe the effectiveness of open data has yet to be proven.

For an effective approach to open data the useful outcomes should be made available and adapted for the widest possible range of users and therefore ensuring a range of considerations needs to be included in the open data process (Gurstein, 2011). Advocates of open data are vocal about the potential positive impacts on democracy. These impacts are significantly harder to identify and need much more research in order to produce comprehensive and reliable results.

In addition, we must realise the difference between transparency and democracy-oriented goals that are usually associated with the freedom-of-information movement and the technology and innovation-oriented goals of the open-data movement (Halonen, 2012). Although freedom of information and public sector reform are important contributors to the Transparency Agenda, the most important motivating factor is arguably the growing realization that the state holds enormous quantities of information (McClean, 2011).

Halonen defines ‘Open Data’ as a term usually referring to non-personal data that is accessible to all and can be freely used, re-used and distributed by anyone. Re-use of data is made possible by releasing data in machine-readable formats and under such a licence that typically allows both commercial and non-commercial usage (2012:18). Yu & Robinson (2012) distinguish the technological and philosophical meaning of raw, unprocessed data which allows individuals to reach their own conclusions (2012:189).

The basic principles (of re-usability) by Tim Berners-Lee of open data are typically listed in a five-star model as follows (Halonen, 2012:19; Berners-Lee, 2010):
• Data is available on the web (in whatever format), but with an open licence
• Data is available as machine-readable structured data (e.g. in Excel, instead of an image scan of a table)
• As in two stars plus non-proprietary format (e.g. CSV instead of Excel)
• All the above plus use open standards from W3C (RDF and SPARQL) to identify things, so that people can point at things created by others
• All the above, plus linking your data to other people’s data to provide context

As Davies distinguishes raw data (2010, 12) the Dutch Parliament encourages public disclosure which she describes as sources of raw PSI (2011):

• Which are public
• Free of copyrights of other rights of third parties
• Paid from public funds, made available for the execution of the specific tasks
• Preferably conform open standards
• Preferably machine readable

Within The Netherlands the National open data portal (www.data.overheid.nl) offers the possibilities for governmental bodies to upload there data. Since this is not compulsory many governmental bodies choose otherwise. Governmental bodies gained much data in order to manage and support business processes both in terms of policy and management. Information accompanying these processes comes from internal and external sources. All this resulted in diffuse structures and quality.

The Practice of Open Data

The Municipality of The Hague

With more than 500,000 inhabitants The Hague is one of the largest cities in The Netherlands (CBS, 2011) and due to its number of issues and supporting data sets an interesting object of study. Since 2003 The Hague developed ‘The Glass City Hall’ to enlarge her transparency and customer focus with ICT. Characteristics of the data architecture and ICT infrastructure were: single storage and multiple use of data, the use of core registration, division into layers and domains, the use of standards.

After an internal investigation in 2007 The Hague noticed the fairly large amount of map viewers, which created disturbance amongst citizens. The internal procedures of map viewers features suppliers, management and exploitation which were cluttered inefficiently amongst several services. In 2008 a concern wide WebGIS service was investigated with the assumptions: single registration, multiple use and a service-oriented architecture using open standards. ‘WebGIS’ had to be a service-oriented architecture consisting out of three layers.

• Data layer with Oracle Spatial databases, in whicht object-oriented data is stored
• Application layer with a map enigin and a GEO server
• Presentation layer with map viewers and a GEO portal

In 2009 The Hague choose Geoweb software and an ArcGIS-server from Esri. The software framework was implemented in 2010 and became operational in 2011. Two Oracle Spatial databases were connected with BORIS (a databse with objects in the public domain) and WebGIS,
supporting topographical surfaces, aerial photographs, panorama photos and cadastral information.

With the renewal of the GEO services Open data has been on the agenda of The Hague for a number of years. In 2011 there was decided to establish open data as agenda issue for the whole organization (Commission Letter, 2011). But despite the fact that the immediate ‘data hunt’ supplied several sources for data sets and applications, the data stopped being opened. Despite the fact that some source holders seemed reluctant in opening their data related to their working processes, an important lesson was the necessity of standardized formats, up-to-date, automatically reachable data sets which contains enough information for developers. We then noticed that opening data was not a natural process. An important element is the attitude and dissemination of open data policy by management. The organization has to invest in the quality, quantity and sustainability of data sets, which are or should be opened not knowing if there is even a demand for the (specific) data. Other reluctant remarks were: managing open data costs money, why should we publish it? How should data be published and is it even part of my job?

In 2012 the Municipality decided to define their policy as ‘Open Data, unless’ (Commission Letter, 2012) after the example of the Ministry of Interior and Kingdom Relation which mentions her ‘Open Government, unless’ policy regarding open data (2013a; 2013b). ‘Unless’ takes into consideration data which may only be opened if personal information is excluded from the data sets, does not form any risk for governance and / or any legal restrictions (Commission Letter, 2011).

Aside the local level the Municipality of The Hague also focuses on the neighbourhood and regional level with collaborative neighbour municipalities and the metropolitan area (see figure 1).

![Figure 1: Region viewer The Hague (Retrieved 18 December 2013)](image)

The Hague also participates in a project on Regional Collaboration GEO-information. The project group has enabled a viewer visualising open GEO data / services of the participating cities. In 2014 the project will launch a metropolitan variety with the ability to compare material of other EU cities (see figure 2).
In order to stimulate openness The Hague has appointed a central project leader and advisor in order to connect with the other 3 large local governments within The Netherlands (Amsterdam, Rotterdam and Utrecht) and create awareness and necessity of opening data by source owners and source holders. The framework which is used focuses on ‘Open data, unless’ policy, adaptation of open data within the information architecture, conditions of information and ICT as well as stimulating a creative and pro-active approach; ‘by design’ rather than ad hoc. Another perspective is to activate an open data store with not only raw data but also creating a platform for sharing knowledge and experience / ideas. The Hague will not itself produce ‘apps’ if no valid reason presented itself, it prefers to leave the initiatives for the society in order not to disturb any possible business models.

The number of data sets is still growing. Since 2012 the municipality opened more than 200 data sets and thus enabling the creation of dozens of applications build by students, developers and others.

In 2013 a project started to explore the full extent of opening data sets. In addition the process of publication has been described. Any doubt of publication is measured by a legal representative with the Freedom of information act. Eventually the management of the department decides whether the data is opened fully or partially. Despite the municipality wide adoption of ‘Open Data, unless’ policy, there is still a lot of cold feet concerning open data; explaining and convincing source holders is very time consuming. In the meantime The Hague is also exploring how data can be made available as Linked Open data, by participating in a National project ‘Platform Implementation Linked Open Data’ (http://www.pilod.nl/wiki/Hoofdpagina, 2014).

The Province of South-Holland

The Province of South-Holland gives home to 3.5 million people on an area of 2.900 km2, which makes it the most densely populated of the twelve Dutch Provinces. The Province has around 130.200 registered businesses. The province also boasts various centres of knowledge and expertise, including three universities in Leiden, Delft and Rotterdam, the TNO research laboratories, Estec and the Innovation Centre’s. The provincial capital is The Hague, which is the seat of national government and the Queen’s official place of residence. The main challenge of the provincial administration is the co-operation with the state government, the municipalities of
South-Holland, the neighbouring provinces and the regional water boards (www.zuid-holland.nl, 2013).

10 years ago data were only supplied to third parties for a supplier’s fee after they had signed a user statement, confirmed by the province. In 2006 the Ministry of Interior and Kingdom Relations requested data to be available for free. It turned out that there was no legal basis on which the province based their policy as data-supplier and no reason for the data not to be freely available. The concerning data was not a major source of revenue for the province, as is the case of many municipalities. As a result, the decision was relatively easy to take to realize free data whilst open data was not yet introduced.

In December 2007 the Provincial Geo Register (PGR) was formed due to a new policy framework. Since then all GEO data of all the provinces was freely available, although a central portal with accessible / downloadable data sets was still missing. At the end of 2008 the first version of the PGR was launched. The first version was based on INSPIRE legislation which enabled provinces to function as large suppliers data, with strong demands concerning availability per province. Due to the inability to realize these high claims form the EU the PGR enabled joint forces. In 2009 all provinces were affiliated with PGR containing a mere 10 data sets.

In 2010 IT architects created a strategic vision for the province directing towards open source, open procurements and open data. This vision was the basis for the ‘Open Provence’ policy (Province of South-Holland, 2011). The policy connects to the central governments directive for open government as mentioned in chapter 1. The policy extends the reactive approach of the Freedom of Information Act and suggests pro-active availability of data.

The PGR has now over 1000 open data sets (2013) and does not only measure up to the demands of INSPIRE but PGR is used for many different sorts of data. On a monthly basis data of the Province of South-Holland is downloaded between 200-500 times. In 2014 a project will start researching the simplification process of the services structure enabling real time data modelling and downloading. The data is also used by several governmental agencies for policy analysis and calculation using different combination of the data. Opening up provincial data using PGR has created several advantages for the province:

- Data is up-to-date.
- Cost reduction of Eur. 50,000, - a year for time used gathering specific information.
- Harmonisation of many definitions with beneficial comparable options.
- Uniform of terms of use.

Conclusion and Discussion

The on-going research programmes have shown to generate interesting insights. Being both rather large specimens of governmental organisations it seems inevitable that the practice within the organisations runs slow when compared to ICT developments and the current developments on economical and societal valuing of (linked) open data. All the interviewees acknowledge the fact that global initiatives seem to rise and grow, whilst they are stilling working on the fundamentals of open data and its acceptance within the organisational processes or defining to whom the data belongs. The more positive outcome involves the capacities of technical infrastructure to automate data approaches without manual actions involving civil servants.
Central systems of open data accessibility seem to generate success by its stability and controllable usage and can even reduce costs. The reluctant postures of deniability towards opening data as a standard versus the ‘why not open it all’ seem to be part of the cultures within both organisations. This questions the organisational culture as success element in introducing open data on a structural basis.

In this stage of the research programmes the outcome of open data seems to solely depend on targets and goals related to open data mainly discussed in policy, which supposed to create foresight and accountability towards generating transparency. Interviewees stipulate on the necessity of this kind of stimulation and active marketing.

One main question in regard to this attitude is creating clarity on the actual ability of open data and what you can achieve with it. Another question focuses on the users / customers thus question vs. demand of the data; as long as these are not defined data source holders are reluctant to open their data. Persuasion often comes from both CIO’s, policymakers and advocates of open data, but with regard to this point policy seem to be the keyword. Open data is therefore presented not as the end but the means. It seems that the thematic approaches generates (some) clarity on channelling the users and necessary data.

Advocates and key experts of open data from both governmental bodies mention the need for structural support of open data and the possibility of bringing open data in front of the processes as well as assigning a legal representative and technical specialist on a central position. Both focusing on stimulation and support of the quality of data as well as forming specific knowledge and information concentrating on open data of the whole organisation. The new and innovative character of open data demands flexibility in order to explore and develop new methods.

The research programmes on which this paper is based upon are still running. What we wish to achieve with the programmes is aggregating knowledge and experiences with best practices for other Provinces and Municipalities adapting open data both structurally and operationally. We see shortcomings in the literature on more adaptive and pragmatic approaches for civil servants and governmental bodies to obtain knowhow and expertise on “planning” open data. In future research we will focus on expanding our best practices with organisational, cultural, legal, technological and functional insights and creating overall indicators to identify major key elements in order to benchmark best practices.

References


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Ed Visser graduated in 1981 as urban planning engineer and started working for the Municipality of Rotterdam. First, as a policy officer urban planning and from 2000 as a GIS consultant. In 2008 he graduated as geo-information scientist and started working for the Municipality of The Hague. He is a consultant GEO information at the Department of City Management since 2010.

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