# COMPARING OPEN DATA POLICIES AND THEIR IMPLEMENTATION IN DEVELOPED AND DEVELOPING COUNTRIES

## *MEMBANDINGKAN KEBIJAKAN DATA TERBUKA DAN IMPLEMENTASINYA DI NEGARA MAJU DAN BERKEMBANG*

**Rininta Putri Nugroho**
Scholarship recipient Kominfo Indonesia
(Delft University of Technology and InstitutTeknologi Bandung Alumni)
Emailrininta:rinintanugroho@yahoo.com.com

### Abstract

Around the world many countries have taken the initiative to encourage open data implementation. Policies are being developed and adapted as guidelines. The development is not seen to be balanced around the world because developing countries are still struggling with the formulation of usable policies and also the implementation. The question that needs to be answered is how comparing open data policies can help enhance the open data process. Another issue is whether or not a comparison is viable for the different characteristics of developed and developing countries. To answer this question a literature study is performed in the field of existing comparison frameworks and comparisons of e-government in developed and developing countries. From this study a framework can be derived to compare the open data policies of different countries and help overcome the difficulties that are faced in the open data process.

*Keywords* : comparison framework, e-government, open data, open data policies, policy analysis

### Abstrak

Di seluruh dunia berbagai negara tengah mengambil inisiatif untuk mendorong implementasi keterbukaan informasi pemerintah. Berbagai kebijakan sedang dikembangkan oleh pemerintah sebagai panduan untuk implementasi. Namun, perkembangan ini terlihat tidak merata karena banyak negara berkembang yang masih belum dapat membuat kebijakan yang cocok. Pertanyaan yang harus dijawab adalah bagaimana perbandingan dari kebijakan keterbukaan informasi dari berbagai negara dapat digunakan untuk meningkatkan proses dari keterbukaan informasi. Masalah lain yang perlu diperhatikan adalah apakah perbandingan kebijakan ini cocok untuk digunakan antara Negara berkembang dan Negara maju. Untuk menjawab kedua masalah ini, sebuah studi literature dilakukan terhadap riset yang sebelumnya telah dilakukan dalam bidang skema perbandingan yang ada dan perbandingan e-government dari Negara berkembang dan Negara maju. Dari studi ini diharapkan dapat dikembangkan sebuah skema yang dapat digunakan untuk membandingkan kebijakan keterbukaan informasi dari berbagai negara ini dan membantu mengatasi kesulitan yang tengah dihadapi oleh proses keterbukaan informasi.

**Kata kunci :** skema perbandingan, e-government, keterbukaan informasi, kebijakan keterbukaan informasi, analisa kebijakan

## Introduction

The field of open data can be seen as a new trend in the world of information and communication technology. Especially with the technological advancements on the infrastructures to support the opening of data, more and more countries are interested in opening their governmental data to the public. Apart from the technological advancements, many benefits and positive impacts that have been identified also play a role in the eagerness of countries to implement open data programs. Some of the discovered benefits include transparency and accountability of the government, participation and self-empowerment to the citizens, economic growth and also stimulation of innovation through re-use of data (M. Janssen, Charalabidis, & Zuiderwijk, 2012). Governments are aiming to become transparent to the public through the massive technological changes, making transparency a benefit from electronic government (Jaeger & Bertot, 2010). In the European Union, opening up government data is continuously growing as more potential benefits are discovered (K. Janssen, 2011). Most of the progress in this field is more seen in developed or Western countries

Jurnal Penelitian dan Pengembangan Komunikasi dan Informatika Vol. 4 No. 3 (Maret – Juni 2014), hal: 159 - 172
Membandingkan Kebijakan Data Terbuka dan Implementasinya                                    Rininta Putri Nugroho
di Negara Maju dan Berkembang

because open data is placed on the agenda by politicians and policy makers (Huijboom & Broek, 2011). On the other hand, developing countries are still struggling with the implementation of e-government and open data which is influenced by considerable factors (Chen, Chen, Huang, & Ching, 2006). Mainly the reason is that the developing countries have not seen open data as a beneficial program to follow for now. As the release of open data becomes more of a common practice in some countries, open data policies have been developed to provide stimulation and guidance (Zuiderwijk & Janssen, 2012). These open data policies are still undergoing research and development to discover the suitable implementation in various governmental organizations both in more advanced countries and in countries with still developing programs. However, some countries, mostly developed countries, have proven to have a positive outcome from their current policies and implementation(HM_Government, 2012; Huijboom & Broek, 2011; The_White_House, 2009).

The question now iswhat factors influence the formulation of open data policies? How can developing countries learn from developed countries in terms of formulating open data policies and implementing them? Can current open data policies of developed countries be directly adopted by developing countries? What factors need to be considered to compare the policies? Frameworks currently exist to compare open data policies on various levels of governmental agencies and organizations (Huijboom & Broek, 2011; Rothenberg, 2012; Zuiderwijk & Janssen, 2012; Zuiderwijk et al., 2012). Using the frameworks to compare open data policies of developing and developed countries, insight can be gained about the differences and thus identify how the open data policies should be implemented. Moreover many lessons can be learned on the open data process in general. The following paper will first discuss the research approach that is used to answer the questions above. A brief explanation about the open data policies will be discussed. Next an overview of the current situation of e-government in both developed and developing countries will be provided. Then existing frameworks for comparing open data policies will be introduced. Then finally the conclusion will wrap up the paper with recommendations for further study.

**Research Approach**

In order to address the issues that are presented in the introduction, a literature study is performed about how developing countries can learn from developed countries about open data policies and implementation. This paper is presented as a literature review of the existing publications that have been completed in the field of open data policies. Initial literature on the topic was provided on Blackboard of Delft University of Technology for the Design of Innovative ICT Infrastructure and Services course. Furthermore, online databases such as Scopus, Google Scholar, Science Direct

and internet searches into existing policy documents provide the needed literature to develop the paper using key concepts found in the initial literature. Other relevant information resources in the field of open government, e-government, and open data were found on various references of articles. The primary source used in this article is "Issues and guiding principles for opening governmental judicial research data" by Zuiderwijk et al. (2012). This source provided a clear understanding of the factors used to formulate open data policies and also provide other resources that proved to be useful. Based on the literature that was founded a thorough review is presented in this paper that leads to the delineation of a problem that can be further investigated in future research. This delineation of the problem is presented in the conclusions of this paper.

*Open Data Policies*

The Merriam-Webster dictionary defines policy as a high-level overall plan embracing the general goals and acceptable procedures, especially of a governmental body. Another definition of policies is a purposive course of action followed by an actor or set of actors in dealing with a problem or matter of concern (Anderson, 2010). When applied to the field of open data it can be said that open data policies provide guidelines that can help stimulate the continuous opening and reuse of data through a well thought plan. For the purpose of this research open data policies are seen as guidelines that regulate the continuous opening of data to the public that is not by request. Also the focus of this paper is on national open data policies that are valid for the opening of data in the country and also specifically for publishing on the national open data portal. Some of these guidelines may not be formally known as national open data policies because they are not strongly reinforced but they are considered as the open data policies that are analyzed here. Open data is predicted to be highly important and valuable. This causes the appearance of some boundaries that need to be regulated through policies. These open data policies can be seen as a way in which a country can guarantee that their government will continue to open data and remain transparent and accountable for all their actions. Besides from ensuring the process of opening data, open data policies aim to achieve a certain impact on the society as does any policy. It can be said that the benefits and barriers to open data depend highly on the characteristics of the governmental agency that is opening their data. The research that is currently being conducted in this field hopes to identify more benefits of open data that can further stimulate the willingness of countries to join the open data and open government movement. However it must be noted that even though there are many benefits that have been identified, there is still lacking clear evidence that leads to proof of the impact (Huijboom & Broek, 2011; Schwegmann, 2012). This is because open data is still a relatively new movement which started

around the year 2009. Most of the benefits are only realized in the long term which is yet to uncover itself at the moment. It is hoped that in the coming years it will become clearer. The following section will provide an overview of the relevant benefits and barriers that is derived from the many existing ones. The importance of providing an overview of these benefits and barriers is because they lead to the development of relevant policies that highlight the benefits and help mitigate the effects of the barriers. The explained benefits and barriers are examples of aspects that are taken into consideration when developing said policies.

The main benefits include the improved accountability and transparency of the government (K. Janssen, 2011; Public_Accounts_Committee, 2012; Zhang, Dawes, & Sarkis, 2005) and also the increase of citizen participation (Schwegmann, 2012). Economic gains are also mentioned as a considerable benefit from opening data, it is said that the value of Public Sector Information in Europe is estimated at 30 billion euro per year (Lundqvist, 2012). On top of that "public bodies hold a large number of data sets that may play a crucial role in innovation through the development of new applications, products and services" K. Janssen (2011, p. 446). Stakeholders that are involved in the open data process have also been discovered to have high hopes for the benefits of opening data even with knowledge about the barriers included (Zhang et al., 2005). In the report about "Learnings from Kenya's Open Data Initiative"(Kenei, 2012) some of the benefits that they have identified to motivate the opening of data in Kenya include transparency, accountability of government and donors to its citizens, empowerment of citizens, promoting inclusive development, and also economic benefits. In a nutshell, it covers all the benefits that were mentioned in previous research as well. Furthermore, open data can be offered to active citizens in order to facilitate innovation (Huijboom & Broek, 2011; Tauberer, 2009). An example is the utilization of open data to develop applications that are more widely used by the public such as traffic applications and updated weather forecasts. Other benefits include the reduction of duplication of data collection and data handling, improvement of policy-making processes and sustainability of data. Reduction of duplication of data collection is best explained through an example of different governmental agencies needing the same data to perform public services which would be more efficient without having to collect the data multiple times but having it available for use by opening it. This would not only reduce the duplication of the data but also lower the costs that are involved. For the improvement of policy-making processes open data can aid policy makers by providing sufficient data that is needed so that they can better understand the problems that they are dealing with and thus take well-informed decisions (Arzberger et al., 2004). Open data is also a way to ensure that the data that is stored is maintained and

protected from being lost thus ensuring the sustainability of the data.

Despite the many benefits to opening data, there still arise many impediments that need to be addressed. To create an effective use of open data there needs to be a balance between the benefits and barriers. Currently research is being carried out and policies are being developed to mitigate the barriers and promote more uses of open data. According to research conducted by Peled (2011), barriers such as the power play of the politicians and governmental agencies are factors that prevent the open data initiative from taking full potential. This is seen as a barrier because then the data that is published may be mistaken as data that has been previously doctored which eliminates the purpose of opening governmental data. Data manipulation of this type can also lead to false results if the data is further used in research by academics. Upon examination of five countries worldwide, certain barriers for open data in each of the countries were derived and presented by Huijboom and Broek (2011). As each country has different motivations to open data, the barriers or impediments that are presented in their research differ accordingly and were placed in certain rankings based on how many countries agreed on a certain barrier. The top barrier was the closed government culture that currently exists making it difficult to change this frame of organization and have them be more open. In past years governmental practitioners have been more accustomed to working in secrecy and not in openness, for the data users this means that there will still be some data withheld by organizations (Australian_Government, 2012). The reason for this is there have previously been policies which actually ensure that governments keep the data private. Another mentioned barrier is the tension between the open data policy and the existing privacy legislations. Although open data is supposed to be as transparent as possible there are certain conflicting interests that arise from how open it can be without publishing information that may lead to the identification of the persons involved.

More barriers mentioned by Huijboom and Broek (2011) are about the quality of the data itself and how useable this data is. Because of the previously mentioned secrecy in the operations of governmental agencies in previous years, the data that is stored or kept is not always of highest quality making it difficult to publish it for useable purposes. In relation to the quality, the data that is published has also been discovered to be in less user-friendly formats which are caused by the lack of standardization of the data that can be published. Commonly used formats for this type of data include excel files or .CSV files which should be standardized in the open data guidelines. Another impediment is that certain datasets require a certain payable fee before being able to gain access. This reduces the purpose of having the data available for public if fees are instilled it limits access to certain parties that may not have the ability to purchase such data. But looking at it from the

Jurnal Penelitian dan Pengembangan Komunikasi dan Informatika Vol. 4 No. 3 (Maret – Juni 2014), hal: 159 - 172
Membandingkan Kebijakan Data Terbuka dan Implementasinya                                    Rininta Putri Nugroho
di Negara Maju dan Berkembang

data provider's perspective, most organizations gain income from selling data which means by providing it on open data platforms for free they are letting go of a source of income. One of the last barriers mentioned in this literature is the unequal access to the open data and network overload by presenting large amounts of data on the existing infrastructure. Unequal access to data is mainly discovered to be true in Spain and the US where there is a digital divide which causes this inequality of access. Unequal access in this case means that even though the data is published for everyone, the infrastructure does not allow some people to have easy access to the data. As for the network overload, this is mainly visible in the US where there are not enough available networks that have the capacity to hold this data because the US is publishing such large amounts of data. A different perspective of analyzing the impediments or barriers to open data is to view it from the data user perspective. There are ten categories of impediments that are identified by Zuiderwijk, Janssen, Choenni, Meijer, and Sheikh_Alibaks (2013) that is viewed as socio technical impediments of open data from the data user perspectives. The ten categories include:

a. The availability and access
b. Find ability
c. Usability
d. Understand ability
e. Quality
f. Linking and combining data
g. Comparability and compatibility
h. Metadata
i. Interaction with data provider
j. Opening and uploading

Most of the barriers identified relate to the ability of users to re-use the data and create value from the data that is published. Based on the research that was conducted, from literature, workshops and interviews, it is clear that there is a need for open data policies that not only puts pressure for the organizations to publish but to also publish data that is usable for the users (Zuiderwijk et al., 2013). At the moment there is still a certain reluctance from data providers to open their data because of the unknown impact (Zuiderwijk et al., 2013). One important barrier is the inability of users to handle the complexity of the data presented and actually use the data presented on the open data platforms. The more data is available it becomes more difficult to analyze and draw conclusions from it (Zurada & Karwowski, 2011). This barrier is also mentioned by M. Janssen et al. (2012) which creates the need for good structure and support in handling and using the available data. Making the data open and available to public may not be sufficient anymore. Additional support is needed for users to actually use this data in a meaningful way. Hence, there is a need for a uniform policy that ensures that the data published is not just published but also accessible for data users to understand and re-use (Zuiderwijk et al.,

2013). Although the policies are still dynamically changing, some countries are considered to have solid open data policies. One of the leading countries in developing their open data directive is the United States closely followed by the United Kingdom. In 2009, the United States first announced their decision to promote a transparent government which sparked other countries to follow this initiative (Huijboom & Broek, 2011). Countries that are considered to have an established open data program include Australia, Denmark, Spain, the United Kingdom, and the United States although each country has different focuses for opening data (Huijboom & Broek, 2011). These five countries can also be considered Western or developed countries which are pioneers in the adoption of internet hence have the ability to utilize their IT infrastructures in more innovative ways (Lee, Tan, & Trimi, 2005). Next an overview of the current e-government situation in both developed and developing countries will be introduced.

*E-Government in Developed and Developing Countries*

Differentiating between developing and developed countries can be done by comparing their GDP per capita, human assets and economic vulnerability (UNCTAD, 2002). According to these terms, developing countries lack the capital and knowledge to build an extensive infrastructure that is needed for e-government to be implemented. According to Chen et al. (2006) there are several differences between developed and developing countries in various aspects of government (the summary can be found in Figure 1). Chen et al. (2006)also argues that e-government development strategies in developed countries may not apply directly to developing countries because of their substantial differences. E-government is considered to be a way for the government to connect with the public, to provide easy access to public services and to provide value added information. According to this opening governmental data can be considered to be an e-government practice.

| | Developed Countries | Developing Countries |
|---|---|---|
| History and Culture | • Government and economy developed early, immediately after independence<br><br>• Economy growing at a constant rate, productivity increasing, high standard of living<br>• Relatively long history of democracy and more transparent government policy and rule | • Government usually not specifically defined; economy not increasing in productivity<br><br>• Economy not growing or increasing productivity; low standard of living<br>• Relatively short history of democracy and less transparent government policy and rule |
| Technical Staff | • Has a current staff, needs to increase technical abilities and hire younger professionals<br><br>• Has outsourcing abilities and financial resources to outsource; current staff would be able to define requirements for development | • Does not have a staff, or has very limited in-house staff<br><br>• Does not have local outsourcing abilities and rarely has the financial ability to outsource; current staff may be unable to define specific requirements |
| Infrastructure | • Good current infrastructure<br><br>• High Internet access for employees and citizens | • Bad current infrastructure<br><br>• Low Internet access for employees and citizens |
| Citizens | • High Internet access and computer literacy; still has digital divide and privacy issues<br>• Relatively more experienced in democratic system and more actively participate in governmental policy-making process | • Low Internet access and citizens are reluctant to trust online services; few citizens know how to operate computers<br>• Relatively less experienced in democratic system and less active participation in governmental policy-making process |
| Government Officers | • Decent computer literacy and dedication of resources; many do not place e-government at a high priority | • Low computer literacy and dedication of resources; many do not place e-government at a high priority due to lack of knowledge on the issue |

Figure 1
Main Differences Between Developed And Developing
Countries Retrieved
from Chen et al. (2006), p.5

Another source also discovers the differences in public policy making for developing countries compared to those of developed countries (Osman, 2002). Osman (2002) identifies that there are key features of developing countries that lead to a different policy context. According to Osman (2002) these key features are:

a. Societies are not well organized to place their demands and exists a lack of interest among citizens about national policies.
b. Decision making is highly centralized.
c. Scarcity of financial sources that prevents donor agencies from being a dominant policy actor.

However one of the important aspects that a developing country needs to increase can be found as one of the studied benefits of e-government, this aspect is trust in the government. An empirical study done by Teo, Srivastava, and Jiang (2008) elaborates the connection between trust and the success of electronic government. According to the research done, the trust that citizens have on the usage of e-government services online is partly affected by their trust in the physical government(Teo et al., 2008). In developing countries trust in the government is usually seen as a huge barrier because of corruption and lack of attention to citizen's needs. Having a more transparent government, by the release of governmental data, can help gain the trust of

the citizens towards the government. This can be used as a motivation to formulate better open data policies with the lessons learned from more developed countries even with the differences that exist.

*Choice of Countries*

In order to be able to analyze in more detail the difference of open data policies between developed and developing countries, five different countries are chosen from the two categories and also reviewed in this section. This section will provide a literature review onto the reason why the countries were chosen and also a brief review of the open government and open data situation in these five countries. It was decided to analyze five countries that have open data programs in various stages of development in order to have a better understanding of the similarities and differences.The UK and the US are included in the comparison because of their influence on the open data movement globally. Both countries are considered to have the most advanced national open data portals and have also been recognized as leading countries in the field of open government. Moreover the choice of the Netherlands to also be included in the comparison is because the Netherlands can be considered as a country that is in the middle of progress in the field of open data. It is not highly advanced as either the UK or US but has progressed immensely over the years. As for Kenya, the development of open data there is still relatively new. It was chosen because their current development with open data is still more advanced than the progress that has been made by Indonesia. Last of all, Indonesia is included in the comparison because of the early stage developments that Indonesia is going through. On top of that, because of personal interest in the development of Indonesia, this is the last country that is compared. To further examine the countries under observation, the following sections include an overview of each country, in terms of open data, individually. Included in the overview are the actions that have been taken for open data, the current open data policy situation, and the goal and objectives for open data in each country.

1. United States of America

The government of the United States (US) is one of the first countries to opt for open data in the world. The US has been a long believer that citizens have the right to know about information the government possesses since the enactment of the Freedom of Information Act in 1966. The importance of the open government movement in the US is clearly seen by the fact that President Obama has made it a high priority since the first day of his administration (Open_Government_Partnership, 2011b). The Open Government memorandum was the first action that Obama signed during his administration on 21 January 2009. Shortly after was the launch of data.gov as the national open data portal in May 2009, in response to

Jurnal Penelitian dan Pengembangan Komunikasi dan Informatika Vol. 4 No. 3 (Maret – Juni 2014), hal: 159 - 172
Membandingkan Kebijakan Data Terbuka dan Implementasinya                                    Rininta Putri Nugroho
di Negara Maju dan Berkembang

the Open Government Directive. The portal intends to increase public access to high value, machine readable datasets generated by the Executive Branch of the Federal Government. In a recent Executive Order in May 2013, President Obama signed the order to the opening of machine readable data as the new default for government information and published a new open data policy. Obama hopes that by doing so that it will help launch more start-ups, businesses, promote innovation and ingenuity that will transform the way many things are accomplished (Sinai & Dyck, 2013). The Office of Management and Budget (OMB) was instructed by Obama to issue an Open Government Directive to implement the principles of transparency, participation, and collaboration (Obama, 2009). Transparency promotes accountability which can in turn improve the overall performance of the government and also to encourage participation of the public through information that is readily available through new technologies. In response to this memorandum, the director of the OMB issued the Open Government Directive to direct executive departments and agencies to take actions and implement the three principles (The_White_House, 2009). In the following months, the Freedom of Information Act (FoIA) was adapted to reflect the new commitment towards an open government in March 2009. The Open Government Directive states that executive departments and agencies are to take certain steps to create a more open government which includes publication of government information online, improvement of the quality of government information, creation and institutionalize a culture of open government, and creation of an enabling policy framework for open government.

In relation to publishing government information online, the memorandum states that it shall always be in favor to openness as is also specified in the newly updated FoIA. However, it also needs to be under the extent that is permitted by law and subject to valid privacy, confidentiality, security and other restrictions. Data quality is also a step that is mentioned in the directive. This is conducted by ensuring that there is a process that is followed according to the Information Quality Act and is regularly maintained. To create and institutionalize a culture of open government, openness should be underlying in any and all government work as is incorporated by senior leaders. This is encouraged by working together as a whole government and together achieving the end goal of an open government. In the memorandum itself, each agency is asked to develop and publish an Open Government Plan that details that agency's efforts in improving transparency. Another course of action is creating a working group that meets to discuss and help each other to create a more integrated open government effort that goes across all the agencies. A policy framework should be created that takes into consideration the usage of emerging technologies to publish the data that is to be opened. Existing policies regarding the release of data that has

already been regulated through the OMB will be updated to provide guidelines that will assist the opening of data through various available technologies. These are the current aspects that are mentioned in the policy document about the open data situation in order to reach the goal of transparency and accountability that is the main goal of open data in the US. From the initial findings about open data in the US, it is clear that it can be considered to be a strong leader in the field. The development of the policies that strongly encourage the opening of data is seen to elevate the level of openness within the government and other organizations. For the research that is presented, it was easy to access all the needed information about the open data process that is followed by Federal Agencies. This is also another reason why the US can be viewed as a leader because anyone can access information about how the data is managed which benefits both the publishers and the users.

2. United Kingdom

Following the US, the UK was next to join the open data movement. However, the beginning of open data in the United Kingdom (UK) began with the Freedom of Information Act in 2000 that stated that the public has the right to access public sector information (PSI). In this case, PSI is what we have defined so far as open data. Another campaign that ignited the awareness of open data in the UK was the "Free Our Data" campaign by a British daily national newspaper The Guardian in 2006. Even though it only reached a small target group of readers, it is still noticeable as one of the first movements towards open data in the UK. A few years later the open data portal of the UK, Data.Gov.UK, was made available since 30 September 2009 although it was officially launched in January 2010. One of the recent changes that have been published in regard with the existing FoIA is that several sections have been adapted to incorporate the free availability of data in machine readable format. This amendment to the FoIA also incorporates the new Code of Practice. These two policies further encourage the re-use of data by ensuring that the data published is in raw format. This allows a broader re-use of the data by users and also promotes the linking of data. Besides providing ways for data users to contact the data publishers in regard to the datasets that are made available or hoped to be made available, it is possible for citizens to participate in the process of designing these policies and guidelines to open the data. For instance the Code of Practice was open for consultation for twelve months before the draft was published. Consultation in this case means that data publishers and users that are active within the Data.Gov.UK communities can contribute to the decision making process by recommending certain courses of action that will ease the open data use and re-use from their perspective.

The focus for open government in the UK has been on increasing public sector accountability, improving

public services and more effectively managing public resources which is stated in two open letters from the Prime Minister to his cabinet. The letters established commitments towards opening data that is held within the governmental bodies such as spending data for the central and local governments, crime data, and data regarding the civil servants. Further to this, the second letter was described as one of the most ambitious open data commitments in the world because of the extensive list of data that was supposed to be opened which included health, education, criminal justice, transport and government financial information (Cameron, 2011). Additionally actions that were taken include the establishment of the Public Sector Transparency Board and the creation of the Open Government License. In terms of policies that regulate the opening of data there are several policy documents that exist. Some of the guidelines used to open data include the Public Data Principles which provides fourteen compulsory principles that were published by the Public Sector Transparency Board, Sir Tim Berners-Lee Five Star ranking system for the re-use process of the data, and the Government Principles for Open Standards especially for software interoperability, data and document formats. In the beginning, the focus of the UK to open their data was also to increase transparency of the government but this has evolved as the open data initiative continues to grow. In the Open Data White Paper, the steps taken to unleash the full potential of open data in the UK are described and commitments of each participating department are provided as well (HM_Government, 2012). Some of the points in the White Paper that are worth mentioning include the commitment to use the Five Star Scheme by Tim Berners-Lee to measure the usability of open data. This will ensure the highest level of usability of the published datasets and in turn will promote the users to re-use the data in innovative ways. It also goes further to commit to include the participation of the data user communities in developing the databases further. This opens the traditionally closed government to have more interaction with the data users and gain feedback on how to improve the data that is disclosed. This also serves as a way to maintain the quality of data that is being published. As mentioned in the previous chapter, one of the concerns that arise from the release of data is the fact that personal information might be uncovered with the linking of several anonymous datasets. This challenge is also addressed in the White Paper by committing to the hiring of a privacy expert that will conduct Privacy Impact Assessments that will mitigate threats that could exist from releasing a dataset. The UK is also considered a global leader in the field of open government and open data. After the initial research that was conducted this opinion is also shared for the purpose of this research. The findings through policy documents and website searches proved that the UK has indeed a strong foundation for their open data and it is also promoted strongly by the government, which is

similar to the situation in the US. The published documents on open data also provide clear guidelines that are beneficial to both the publisher and the data user in order to manage the data that is opened. Even though, through the initial research that was conducted, no mention of having to open the data is found, it is evident that the UK have been actively opening data through the open data portal.

### 3. The Netherlands

The Netherlands has been ranked second for 'open government' in the World Justice Project's Rule of Law Index for 2010 (Open_Government_Partnership, 2011a) which shows its strong grasp on the principles of open government. This is also reflected on the long presence of the Government Information (Public Access) Act (Wet Openbaarheid van Bestuur; WOB) since 1980 which has been amended to fulfill the more specific requirements of open data. However, the open data movement started when the Obama administration announced their open government directive and this created the initiative to follow in the Netherlands as well. Although the Netherlands is not considered one of the first countries to come on board with the open data movement, there has certainly been increasing progress in the field. In September 2011 the Minister of Interior and Kingdom Relations launched the national Open Data portal (data.overheid.nl) which is motivated by the need to get commercial value and contribute to economic growth after data enrichment that is done by the citizens. It is also said to lead to a more transparent government, stimulate economic activity, build an efficient government, improve the public services, and drive innovation. Under the Action Plan for the Open Government Partnership, there are certain areas which the Netherlands has committed to improve in order to move towards a more open government. These areas include amendments to the WOB, active publication policy, open data programs from each of the ministries, efforts in the area of integrity, increasing the number of civil society initiatives, and improvement of various public services. Each of these areas shows the structured plan of the Netherlands to prove their country to be as open as is ranked. Through the WOB, citizens had the right to request for information about an administrative matter to an administrative authority. Most of the information that is produced by the government is made public under the WOB. Now, with the launch of Overheid.nl, this data is available for easier access which also aligns with the government's latest actions to promote the reuse of government information. The portal consists of no actual data but a reference index that provides access to sources of government information, an overview of the possibilities that data reuse can provide, news and background information about open data in the Netherlands, and also links to forums for citizens to actively participate in discussion about open data. As of now, the open data portal consists of over 5000 dataset links, the complete Dutch

Jurnal Penelitian dan Pengembangan Komunikasi dan Informatika Vol. 4 No. 3 (Maret – Juni 2014), hal: 159 - 172
Membandingkan Kebijakan Data Terbuka dan Implementasinya                                    Rininta Putri Nugroho
di Negara Maju dan Berkembang

legislation and other deep links to publicly available government information which are all available for free reuse.

On the portal of Overheid.nl, there is much information about suggested guidelines to open data. However, these guidelines are not yet compiled in an official policy document. There is also not a law that forces any governmental bodies to publish their data. When observing the existing guidelines that are available on the portal, it can be seen that these guidelines are very detailed and provide usable guidance when a data owner wishes to open the data. The guidelines consist of five steps that are involved with the process of opening data. The steps start with deciding which data is suitable to publish. This step-by-step process is shown in a flow chart diagram that takes the publishers through the process. Another guideline that is included is about deciding which license is needed for the data or the legal check. The next step involves explaining how best to organize the data that is published and the tasks that are involved. The last step is to include identifiers to the data to make the data discoverable and accessible. This step-by-step process is only given as encouragement and best practice and is not obligated to be followed. To create these guidelines into formal policies it has proved to be a long process which could still take years to complete. Continuing efforts to increase the availability and provision of data, there are three areas that have been identified to stimulate the reuse of open government data which includes the usage to address specific societal issues, usage by the public sector itself and stimulating commercial reuse. Because of the lack of policies, the overview of the Netherlands is unable to be as detailed as that under the US or the UK. It is interesting to note that even without policies of such, the guidelines that are made available are detailed and if followed can make opening data considerably easy. This is one of the reasons the Netherlands is included in review because these guidelines are available even if they are not considered policies. The Netherlands is further considered as a country of interest because in rankings and surveys (Open_Government_Partnership, 2011a; United_Nations, 2012) it remains one of the highest ranked countries for openness or e-government.

4. Kenya

The start of open data in Kenya can be seen to have a longer story compared to the countries that are stated above. Different from the US, UK, or the Netherlands, Kenya had a sense of urgency to apply open government to help the development of the country as a whole. Under former President Daniel arapMoi, between years 1978-2002, the government restricted the free flow of information and hindered other forms of media networks. This was held under the Official Secrets Act that had existed from the colonial era. Under the influence of such an Act, it is understandable that the government culture was built to restrict access to

information from the public and to closely guard all categories of information. It could be said that there was a pressing need for transparency and openness in order to rid the country of corruption. In 2005, BitangeNdemo became the permanent secretary of Kenya's Ministry of Information and Communications and brought changes within the government that would enable a more open government. On 8 July 2011, President Kibaki officially launched opendata.go.ke with 200 datasets that were categorized into education, energy, health, population, poverty, and water and sanitation. The launching of the website also launched the Kenya Open Data Initiative which was an important step for the country. When the portal launched, Ndemo wanted to avoid confrontation with public officials on publishing non-public data by launching the portal with data that was already categorized for the public but not yet published. However, no policies were enacted to ensure the government opened their non-published data. In 2010 there was an addition to the constitution which called for the government to "publish and publicize important information affecting the nation". This constitution amendment was the anchor to the open data efforts instead of waiting for the Freedom of Information law. Another document that contains statements about open data is the Vision 2030 Plan, which is a long term development blue print launched in 2008. This Plan provides the means towards a more open government through ICT infrastructural developments. However, because of the lack of Freedom of Information law there is no legal background or formal policies that enforce the government to open the data. To the extent of the document search that was conducted for this research, there were no mentions of formal policies that regulate the opening of data. There is however, mentions of requirements on the opendata.go.ke portal about the data that is to be published. Similar to the situation in the Netherlands but significantly less detailed. Issues such as licensing, privacy, metadata, and formats of data are mentioned very briefly and merely suggested as best practices. It is mentioned on the portal that there are mechanisms for users to present recommendations about the data. This is meant to provide input for the continuous evolvement of the portal. On the global scale, Kenya has also made a statement to the world by joining the Open Government Partnership. Through the OGP, Kenya has formulated an action plan that is committed towards addressing certain areas of open government. The areas include the improving of public services, increasing public integrity, and more effectively managing public resources. The action plan also states many on-going initiatives that are targeted at solving these areas along with the target dates of accomplishing the plan (Open_Government_Partnership, 2012). The Freedom of Information law is currently still tied up in parliament and has yet to be announced as a new law. This law may be one of the turning points needed for the Kenya Open Data Initiative to be completely in action. Kenya is said to be the first developing country to launch

an open data portal (opendata.go.ke), which is one of the main reasons why it is included in this comparison. From a different perspective, the other countries in this research are all considered to be developed countries. Also, because the intention of the research is to create a recommendation for Indonesia, Kenya is a good example of how open data can be beneficial to a country's reformation.

5. Indonesia

In Indonesia the need for open government came in line with the 1998 riots and the fall of former President Soeharto. It became clear that the government needed to make drastic changes towards a more transparent government because of the heavily rooted corruption that had permeated into many areas of the government. This brought around changes in the way the public responded to governmental actions and also led to the start of the democratization process. In 2004, the devolution of power came to Indonesia through decentralization of the government. Since then, many efforts have been implemented to empower the citizens to be more engaged in public affairs. Openness in government activities is hoped to trigger the bureaucracy reform between sectors (Sekretariat_OGI, 2012). This will lead to transparency and can improve un-effective and inefficient processes and procedures within the government. This will also clarify systems and procedures that are needed to provide high level of service to the public. These factors are considered to be the end goal or objective of open data in Indonesia at the moment. The Open Government Indonesia (OGI) movement started in September 2011. In the effort to enforce the open government movement in Indonesia, a specific unit was appointed under the President called the UKP4. This unit is tasked with all the open government duties, also those related to the global Open Government Partnership of which Indonesia is co-chair in 2013. In 2008 the Freedom of Information law was decreed which is used as one of the legislative backgrounds for opening data in Indonesia. However there are not specific open data policies that are targeted at opening data on an online portal. The FoI law is already considered a big step towards a more transparent government. It gives citizens' rights to information related to public policy making, encourages active participation of the citizens, and improves the managing of public services. Because Indonesia is only at the very early stages of becoming an open government, many policies are still needed. Currently there only exists the 2008 FoI law in the field of open data which simply encourages the publishing of public information and does not force it. A specific law that regulates and guides the actual publishing is still lacking. The information that can be included in this section about Indonesian open data is very limited because of the lack of information that is available about the topic in general. Most of the information that is on the OGI website relates to the long term plans for openness that

Indonesia wishes to accomplish. It is not focused on open data or the policies that have been enacted so far. From the initial desk research that was conducted on Indonesia open data, it can be seen that open data is still in the very beginning stages of development in Indonesia. At the moment there is more focus on gathering awareness on the matter of open data and open government rather than formulating policies on the opening of data. From the desk search, there was not found to be any regulations that mention the need for specific data types, formats, licensing, or any other policy related aspects as were mentioned about the previous countries. However, the designation of a specific taskforce to ensure the development of open government is a sign of Indonesia's seriousness in joining the global movement. Also by participating in the Open Government Partnership, Indonesia has made an international statement of its commitment to the movement.

### *Frameworks For Comparison*

Several sources have stated that a comparison of open data policies and implementation can assist the better formulation of the policies and overcome some of the current obstacles(Huijboom & Broek, 2011; Zuiderwijk & Janssen, 2012; Zuiderwijk et al., 2012). In this section a brief explanation of the current frameworks that have been developed for this purpose will be given. Before explaining the existing frameworks, a look into the domains that need to be managed for efficient data access which is essential to open data will be explained. These domains are the building blocks on which the open data policies are developed then are translated into the elements that need to be analyzed when comparing different policies. The domains that need to be assessed for data access management include technological (T), institutional and managerial (IM), financial and budgetary (FB), legal and policy (LP), and cultural and behavioral (CB) considerations (Arzberger et al., 2004). Arzberger et al. (2004)argues that these domains are in itself "a framework for locating and analyzing where improvements to data access and sharing can be made". The domains can also be seen in Figure 2.

Jurnal Penelitian dan Pengembangan Komunikasi dan Informatika Vol. 4 No. 3 (Maret – Juni 2014), hal: 159 - 172
Membandingkan Kebijakan Data Terbuka dan Implementasinya                                                    Rininta Putri Nugroho
di Negara Maju dan Berkembang

Figure 1
Data access management domains by Arzberger et
al. (2004)

Moreover attempts have also been made to develop guidelines for the opening of government data(Zuiderwijk et al., 2012). Issues that need to be taken into account when opening data have been identified that are also part of formulating open data policies. According to research conducted by Zuiderwijk et al. (2012)on data of a ministry in the Netherlands, there are general issues and dataset specific issues that need to be taken into account when opening the data. General issues include the confidentiality, deletion policy, embargo placement, organizational changes, ownership of data, privacy sensitivity, lack of metadata, use and reuse of data, policy sensitivity and unlawfulness. Dataset specific issues include the completeness and exhaustiveness, representation, validity, reliability, clearness, provision of additional reports, and overall data quality. These issues combined with the data access domains formulate the basis of the comparison frameworks that exist. Zuiderwijk and Janssen (2012)have developed a framework designed to compare open data policies in two Dutch ministries. As can be seen from the aspects, they follow the basic domains that were previously mentioned which are given in brackets beside the aspect mentioned. Aspects of the policy that were examined for this purpose include the following(Zuiderwijk & Janssen, 2012):

a.  Type of policy measures (IM and LP)
b.  Principles for opening up data (IM and LP)
c.  Processing of data before opening (LP and T)
d.  Amounts of opened data on national open data portal (IM)
e.  Types of open data (IM and T)
f.  Target group for open data (IM)
g.  Format of open data (T)
h.  Provision of metadata (T)
i.  Type of data not opened (LP)
j.  Type of use of opened data (LP and CB)

k.  Technical support for the use of opened data from the ministry (T)
l.  Positive impact of opening data (CB)
m.  Negative impact of opening data (CB)
n.  Insight into the effects of opening data (CB)

After an analysis of the open data policies between the ministries, Zuiderwijk and Janssen (2012)identified that there were indeed differences between the ministries in their process of opening data. It was also identified that from these differences, recommendations to the other ministry in the comparison could be made thus deriving lessons learned from the framework. However Zuiderwijk and Janssen (2012)also state that further refinement of the framework should be conducted for different comparisons. Another existing framework, also developed byZuiderwijk and Janssen (to be published), is a more refined version of the previous mentioned framework. This framework was developed to compare the open data policies of governmental organizations and agencies on a lower level. It includes more detail about the open data process that is carried out by different levels of the government. This framework is separated into the policy (input), policy impact (output) and the expected public values (outcome). The input is again refined into different categories including the environment and content (level of government organization, policy objective), policy type (type of policy, policy measures and instruments, principles for opening data), and also the technical content (data processing, amounts, types, costs, target group, format, metadata, type of unopened data, technical support). The output on the other hand is identified through the actual and expected policy effects (type of use, risks, and benefits) and the outcome is the impact it has on the public. The domains that categorize the elements in the comparison framework are based on the policy making cycles of Stewart Jr, Hedge, and Lester (2007) which include agenda setting, policy formulation, policy implementation, policy evaluation, and policy change or termination. The framework that was developed is used for comparing open data policies at different government levels within the Netherlands. The reason for this is that a closer look into the policies that exist at the lower levels of the government will affect the national policy too. Zuiderwijk and Janssen (to be published)argue in the paper that the differences and similarities that were derived from the comparison can be used as opportunity to learn from each other policy. For this study the lessons learned were that organizations need to be involved in collaboration, focus more on the impact, create a culture with opening data as a standard procedure and to stimulate the use of open data(Zuiderwijk & Janssen, to be published). The framework that was developed can be seen in Figure 3.

**Policy environment and context**

1] Country
2] ... of government organization and mission type
3] key motivation, policy objective
4] open data platform launch
5] resource allocation and economic context
6] legislation
7] social and political context, ... in which the opening of data is institutionalized

**Policy content (input)**

8] ... strategy and principles for opening data
9] ... policy measures and instrument
10] ... ccessing of data before publication
11] amounts of opened data
12] types of open data
13] way of presenting data
14] ... charged for data access
15] target group(s) for the open data
16] ... technical standards and formats for open data
17] provision of metadata

18] types of data not publicized
19] technical support for the use of publicized data
20] active encouragement of data re-use and promotion of open data
21] data quality
22] data license
23] availability of data without application or registration and without requiring user detail
24] structure of relationship between information suppliers and user

**Performance indicator (output)**

25] usages of publicized data
26] risks of publicizing data (possible negative impact)
27] benefits of publicizing data (possible positive impacts)
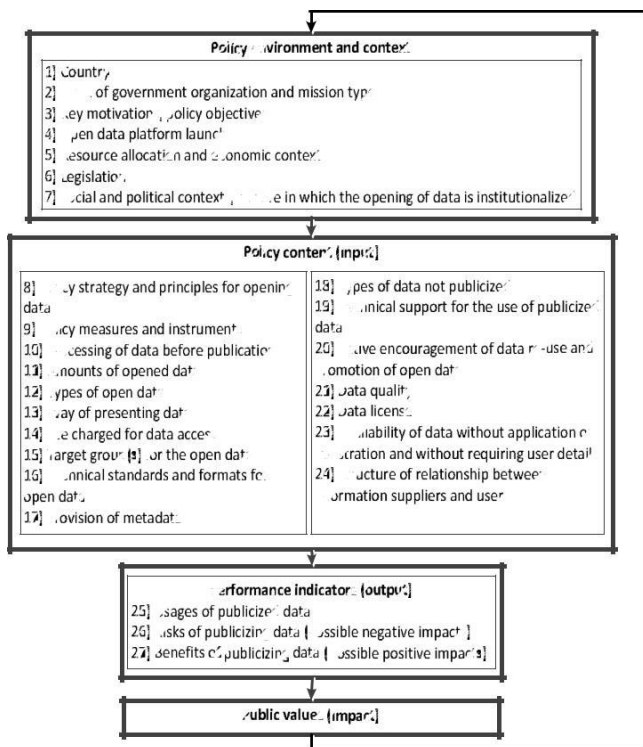
**Public values (impact)**

Figure 2
Open data comparison framework by Zuiderwijk
and Janssen (to be published)

In a different study by Gibbs, Kraemer, and Dedrick (2003), a framework for comparing the diffusion of e-commerce in different countries is presented. The use of this framework is to identify the additional elements that need to be inspected when performing a cross country comparison as opposed to a lower level comparison as conducted in the abovementioned frameworks. According to Gibbs et al. (2003), factors of global environment and national environment need to be taken into consideration when developing a comparison of this scale. The national environment factors that are mentioned include demographic factors, economic and financial resources, information infrastructure, organizational environment, public preferences, and national policies on legislation and the promotion of e-government. On the other hand, the mentioned global environment is not relevant for the study of open data or open data policies and is not taken into consideration for this research. From the study of these factors, many lessons can be drawn in conclusion about the adoption of e-commerce and e-government to some extent. Because this framework was developed for a more global view on how to compare different countries not all of it is applicable to this thesis. Although a global view needs to be analyzed when conducting a cross-country comparison, for the case of open data policies a more detailed overview of the technical aspects that are involved with open data should also be considered. However, this framework provides the elements from the national environment that need to be

compared which should be included in a comparison of the open data policies. Another source that compares open data programs and the implementation of open data policies across different countries is provided by Huijboom and Broek (2011). The countries that are evaluated in this literature are the five countries that are considered to have an established open data initiative (Australia, Denmark, Spain, UK, US). This comparison is mainly focused on the implementation of open data policies, instruments used to implement their open data strategy, and how they are motivated and hindered in each country. However it can also be seen through this comparison that there are similar factors that are evaluated compared to the previous framework by Gibbs (2003) such as the economic instruments that the country owns to execute the policy which is considered the national environment. The factors compared include the education, voluntary approaches, economic instruments, and legislation and control. A limitation from this framework and also to the previous framework by Gibbs is that they do not take into consideration that cultural aspects or even specific forces or counter forces might be the underlying cause as to how open data is progressing in those countries at a different pace.

### Conclusion & Recommendation

Countries around the world have massive amounts of data that has been collected over the years. Not only is there central government data but also data from the local governments, agencies, various organizations, and also the private sector. There are many things that can be achieved with this collection of data that have yet to be fully discovered. In some countries, freedom of information has been implemented within legal frameworks to create a culture of openness. With the recent shift toward a more digital era, there are several possibilities for data to reach its full potentials. Data is made available in formats that are easier to access and reuse. By making these changes and embracing the concept of open data it is possible for nations to improve their government efficiency, increase transparency, and create new possibilities through innovative inventions. Research has increased in the field of open data to identify what changes can open data really bring to countries. With increasing research into the benefits, many barriers have also been identified. These issues come to play when more organizations are being asked to make their data openly available. The importance of identifying these benefits and barriers is because they lead to the development of relevant policies that highlight the benefits and help mitigate the barriers. Some of the benefits that are identified include economic gains, improved accountability and transparency, increase of public participation, development of new innovative applications, improvement in policy making processes, sustainability of data, and reduction of data duplication. On the other hand the barriers that need to be mitigated include the

Jurnal Penelitian dan Pengembangan Komunikasi dan Informatika Vol. 4 No. 3 (Maret – Juni 2014), hal: 159 - 172
Membandingkan Kebijakan Data Terbuka dan Implementasinya
di Negara Maju dan Berkembang
Rininta Putri Nugroho

closed government culture, privacy concerns, lack of attention on data quality, lack of usability, accessibility of the data, and also difficulty from the data users to understand the data. A distinct issue that is discovered is the lack of judicial regulation towards the open data process.These are issues that are mentioned based on previous research and are relevant to the formulation of open data policies.

So far, the leaders of open data programs are from developed countries such as the UK,the US and the Netherlands with high priority given to the establishment of e-government practices. Developing countries are seen to still struggle with the implementation of e-government although the little progress that has been made is shown to bring benefits. Open data, as one e-government practice, is also seen to push governmental agencies to become more transparent thus gaining the trust of the citizens. This is one benefit that can help developing countries in terms of the relationship between the public and the government. It can also be seen that different countries are in different stages of open data development and their focuses are also different. For open data to develop in developing countries, open data policies need to be better formulated as guidelines and stimulation to the process. By comparing existing policies of developed countries to those of developing countries, many lessons can be derived from the comparison. A look into the open data situation in countries such as the US, the UK, the Netherlands, Kenya and Indonesia can help discover that comparisons between these countries can be highly robust and interesting to uncover the many similarities and differences that occur. The various stages of development and also the different policies can be used as a picking ground for improvements of the lesser policies. It is also identified in this paper that Indonesia can be a country of interest to develop recommendations for. With the current progress in open data for Indonesia, this country is considered to be at the starting point of implementation and can benefit greatly from a comparison study that is recommended to pursue as a continuation to this literature review. However with this comparison, additional factors need to be taken into account that differentiates developed and developing countries. Some of these factors include the demographics, political views, economic stability, technical support, and the citizen's awareness of governmental aspects. Adapting existing frameworks to be able to compare the open data policies between developed and developing countries are recommended for further research. The result of this study can be both a framework and a policy recommendation for the development of open data programs in developing countries. Recommendations that are formulated based on the literature review in this paper are as follows:

1. Conduct a comparison of open data policies in different countries in order to develop lessons and recommendations to improve less developed open data policies.

2. Conduct a comparison of open data policies targeted to formulate recommendations for Indonesia's open data policy development

3. Conduct research to compare other aspects of the open data process to be able to develop further recommendations towards the process.

4. Create a comparison of the services that utilize and do not utilize open data.

5. Identify the impact of open data for the government,

Through the recommended research that is suggested, it is hoped that open government and open data can fully realize its benefits and bring a change to governments around the world. The technological advances that have been developed for many years should also be beneficial to creating more effective and efficient government processes.

*Note: at the time of writing this paper, the author has completed the recommended comparison framework and open data policy recommendations were formulated for Indonesia. The results of this research are currently published under the Delft University of Technology repository and a scientific article is being written based on this research.*

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