

Open data directives and policies

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Chapter 3

Open Data Directives and Policies



“Currently a multiplicity of open data policies is under development at governmental agencies at various administrative levels, aiming to stimulate and guide the publication and use of data and to gain advantages from this.”

3.1 Introduction

In developing open data policies, organizations aim to stimulate and guide the publication and use of data and to gain advantages from this. Often open data policies are guided by a high-level directive, such as those of the United States (Obama, 2009b) and the European Commission (European Commission, 2013c). Open data policies are important, as their purpose is often to ensure the long-term availability of government information to create transparency and thereby to contribute to citizens’ rights of public access to government information. This right is considered a fundamental tenet of democracy (Allen, 1992). Moreover, open data policies have the potential to increase the participation, interaction, self-empowerment and social inclusion of open data users (e.g. citizens) and providers alike, stimulating economic growth and innovation and realizing many other advantages.

Currently a multiplicity of open data policies is under development at governmental agencies at various administrative levels, such as policies being developed by the United Arab Emirates, Kenya, the region of New South Wales, the province of Utrecht in the Netherlands and the city of New York in the United States. Further developing the open data policy framework developed by Zuiderwijk and Janssen (2014a), this chapter explores the elements and characteristics of open data directives and policies. We look into the policy environment (context), the policy content (the policy input), policy implementation (performance indicators; the policy output), evaluation (public value realization; the policy impact) and policy change or termination (feedback). Furthermore, this chapter provides several examples of influential open data directives and policies that have been developed in the past two decades and it looks into the different levels (e.g. different administrative levels) at

which open data policies have been defined. Subsequently, an in-depth case is provided concerning the development of the open data policy in The Netherlands. Finally, this chapter provides lessons learned from the development of open data policies that are useful for open data policy makers.

3.2 Policy: A Definition

A policy in general can be defined as “a purposive course of action followed by an actor or set of actors in dealing with a problem or matter of concern” (Anderson, 1990, p. 5). Policy deals with processes, activities and/or decisions that tackle societal problems (Stewart, Hedge, & Lester, 2008). Policies aim to achieve a certain impact in society and should include the factors that contribute to and influence this impact. Policies are developed using policy-making cycles which can consist of stages including problem identification and agenda setting, policy formulation, policy implementation and enforcement, policy evaluation, and policy change or termination (Stewart et al., 2008) (see Fig. 3.1).

In the first stage, the policy definition stage, the problem is identified and analysed. This results in the need to develop one or more policies. Moreover, the desired effects or outcomes, the scope, the target audience, and the timeline of the policy are often formulated. Subsequently, the actual policy is developed. This stage includes the problem analysis and the identification of alternative solutions. Thereafter, the implementation and enforcement stage start and the selected policy is implemented, for instance by adapting regulations or developing new services. Finally, the policy needs to be evaluated to ensure that the intended outcomes are realized. Based on the evaluation outcomes the policy may need to be changed or terminated. Then this whole

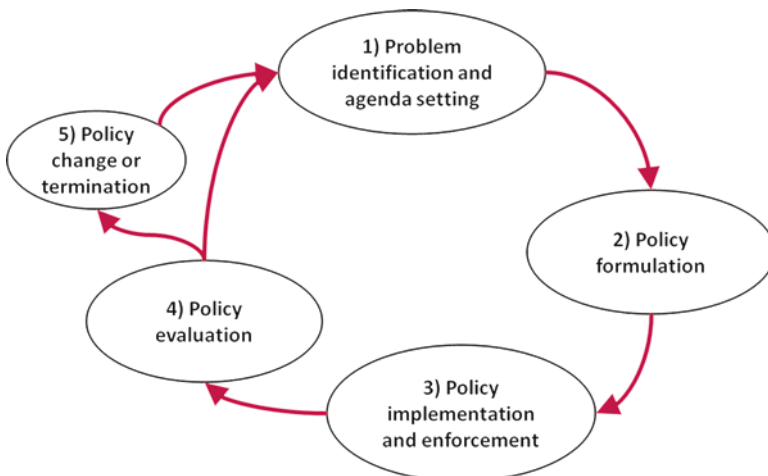


Fig. 3.1 Policy cycle. (Adapted from Stewart et al. (2008))

process starts all over again. Depictions of the policy process or policy stages vary through the literature and can be different per country and context. In addition, the order of the stages may differ. Policy development is often not a linear process and there are usually many iterations.

Policies, and particularly *open data* policies, are more than written documents in which intentions, choices and actions are described, as they define the broad open data regime of organizations and how they are realized and create their actual impact (Zuiderwijk & Janssen, 2014a). Following (Anderson, 1990, p. 5), we state that open data policies are *a purposive course of action followed by an actor or set of actors in dealing with open data-related issues*. This encompasses both dealing with issues related to the publication and related to the use of open data. Following Stewart et al. (2008), we state that *open data policy encompasses processes, activities and decisions that tackle open data related issues*. Open data policies can cover certain elements of the open data lifecycle or they can cover the complete lifecycle (see Chap. 2 about the open data lifecycle). When they cover the complete lifecycle, this means that they include the collection of data, the way that this data is opened and published, the place where it can be found, as well as how the data can be used and how feedback is dealt with. When they focus on a particular element, they can be focused on either obtaining access to data or on data protection or both. This is not always explicitly defined in a document but can also be an existing practice. For instance, we may consider the way that a governmental organization has been opening up its data in the past ten years a set policy, even if it is not explicitly described in a document.

3.3 Elements of Open Data Policies

Zuiderwijk and Janssen (2014a) developed a framework for comparing and evaluating open data policies (see Fig. 3.2). Based on the phases of the policy making cycle as defined by Stewart et al. (2008), they state that open data policies consist of the policy environment and context, the policy content (the input), performance indicators (the output) and public values (the impact). We extend this framework by adding open data policy change or termination as a fifth element.

The *contextual elements* of open data policies concern the open data policy environment. For example, this includes the regulatory context, the social context, and the political context. The contextual elements influence the *policy content*, including the policy strategy, the policy principles and practical aspects of opening data, such as the data quality and metadata provision. Policy content refers to the input for realizing societal values and contains the issues covered by the current open data policies. The combination of aspects that are part of the input of the open data process is expected to aim for a certain *output*. The policy output can be measured with performance indicators, such as the number of datasets opened up and the type of data use that takes place. Performance indicators can assist the *open data policy evaluation* and can show which *public value* is realized. Open data policies should

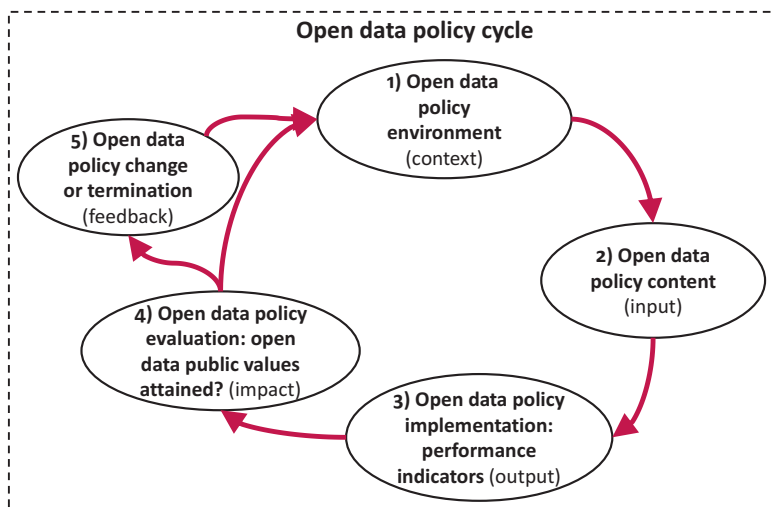


Fig. 3.2 Open data policy cycle. (Adapted from Stewart et al. (2008) and Zuiderwijk and Janssen (2014a))

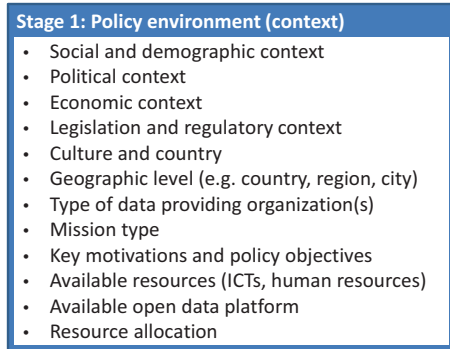
not only focus on the opening of data, but they should pay special attention to improving the use of and value creation with open data. Policy evaluation should reveal the policy's impact on society, such as the creation of transparency and economic benefits. Finally, the evaluation will show whether the open data policy should be changed or terminated or not. *Feedback* on the policy may lead to policy improvements. Ideally, this cycle is iterated many times.

As policies are in a continuous state of flux, this framework can be viewed as a kind of policy-making cycle in which the created public values will influence the environment, context and policies. Below we will discuss each of the possible elements of open data policies using this framework. Note that open data policies are diverse and do not necessarily contain exactly these presented elements. Other elements and other orders are also possible.

3.3.1 Stage 1: Policy Environment (Context)

The first stage of the open data policy cycle concerns the policies' environment and its contextual aspects. In this stage, the problem is identified and agenda setting takes place, depending on the social, political, economic and regulatory context (see Fig. 3.3). The *social and demographic context* concerns the composition of the population, such as the age distribution, income, religion, behaviour, norms and values. The *political context* concerns the government structure, the government organization, and the way decisions are made. The *economic context* refers to the economic and financial situation, including the budget available for developing and

Fig. 3.3 Open data policy environment (context).
(Adapted from Zuiderwijk and Janssen (2014a))



implementing the open data policy. The *legislation and regulatory context* comprises the laws and regulations that need to be taken into account when developing the open data policy, such as European open data directives and the Open Government Law in the Netherlands (‘Wet Open Overheid’ in Dutch). Developers of open data policies need to take into account the legislation that the policy is related to, and they may refer to this in an open data policy document.

Problem identification and agenda setting are also influenced by other contextual aspects, such as the *existing (organizational) culture* (e.g. the level of individualism and collectivism, power distance, and long term/short term orientation (see Hofstede, 2001)) and the *geographical level* (e.g. the country or city in which the policy is developed or the objectives of the organization that develops the policy). Furthermore, open data policies often include the *type of data providing organization(s)*. Some open data policies are created for a large range of organizations (e.g. a country’s national open data policy), whereas other open data policies are specific to a particular organization (e.g. a ministry).

In the *mission* of these organizations open data can be, for instance, regulatory, strategic, or a social service.

- *Regulatory*. Opening data regulatorily may concern an organization that opens up data because it is forced to do so according to national or international legislation. For instance, a museum or library may be forced to open up (part of) its data because of the European PSI-directive or a national open data policy.
- *Strategic*. Opening data strategically concerns opening up data for the purpose of showing how transparent the organization is, to enhance trust of citizens or clients, or for obtaining feedback on the data collected by an organization to subsequently improve the quality of the data or the quality of work processes. For instance, as an example outside of the government context, Nike opens up factory, footprints and materials data that gives insights in the working processes of the company. This should enhance monitoring effectiveness and improve workers’ conditions (Houk, 2011).
- *Social service*. Data provision as a social service may concern an organization that aims to open up data to create a more effective organization, build a stronger community or promote new opportunities. For example, a national government

may open up its data to build a community of entrepreneurs that have equal access to open data and that can use open data to develop new business models.

Open data policies may contain these types of missions, as well as the *key motivations and policy objectives* for opening data. The motivations and objectives can be on a high level of abstraction, such as innovation, transparency, participation of citizens, and economic value creation, or they can be more specific, such as providing a certain type of data to a certain community so that useful applications can be developed for a certain target group.

Other contextual factors influencing the development and design of open data policies include the available Information and Communication Technologies (ICTs), such as an appropriate internet infrastructure, *open data platforms* and Application Programming Interfaces (APIs), but also the *availability and allocation of resources* such as skilled personnel for making data available and providing data in a useful format. Open data policies sometimes define the resources that are needed for opening and using data, or even the budget that is available for this. The open data policy may also give information regarding where the data is published, for instance, on a national open data portal.

3.3.2 Stage 2: Policy Content (Input)

In the second stage of the open data policy cycle the content of the open data policy is defined. This stage consists of a number of key elements, some of which are more related to the data opening processes and others which are more related to data management (see Fig. 3.4).

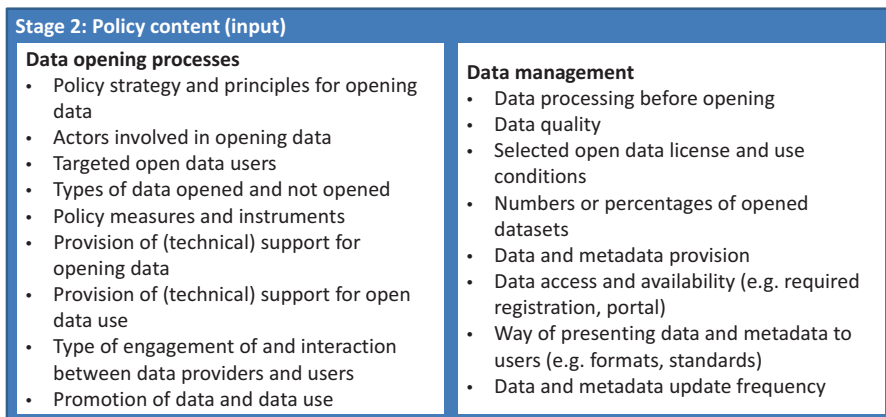


Fig. 3.4 Open data policy content (input). (Adapted from Zuiderwijk and Janssen (2014a))

3.3.2.1 Data Opening Processes

The open data policy content concerning data opening processes includes the *policy strategy and principles for opening data*. This strategy and these principles sketch the outlines of the way the policy is intended to work after implementation. For instance, data may be opened only to certain target groups, or to any user. Another principle is that data is open by default, which means that the data is opened by default, unless there are significant barriers such as privacy aspects or data sensitivity. Open data policies may also include the *actors involved in opening data*, such as the parties involved in opening up data and the parties involved in publishing the data on open data platforms. Open data policies may describe the *typical open data users that are targeted*. This can be done in a detailed level (e.g. technically-skilled application developers in the areas of geographic information or academic researchers in the social sciences domain) or on a high level (e.g. citizens, developers or researchers).

Open data policies may contain the *types of data that are not opened*, such as incomplete data, data that is sensitive to misuse, and policy-confidential data, and they may make explicit or give examples of the *types of data that is opened*, such as data on certain topics or from certain registers. Open data policies describe the *measures and instruments* that are used to develop and evaluate the policy, such as websites, letters, speeches, networks, and social media. Other examples of such measures and instruments are fines and rewards, that can be used to stimulate data opening, for example by having a policy that requires departments within the organization to explain if a certain condition of the policy cannot be met. Open data policies can also describe multilateral instruments, such as contracts, to stimulate data opening.

Some open data policies provide information concerning the *technical and non-technical support that should be given to data providers and to data users*. For instance, data providers may be supported by a data steward who can explain or check whether data protection legislation would be violated if a certain dataset would be opened. Data users may be supported via support tools on the open data portal, via e-mail, and via social media. Open data policies may discuss the *type of engagement* that is envisioned between the data provider and the data user. There may be much interaction and feedback processes could be institutionalized, this may be lacking completely or there may be some level of engagement and interaction in between. The open data policy defines *whether data use is promoted* to potential new open data users and how this is done. For instance, data use can be encouraged through the organization and advertisement of hackathons and app contests.

3.3.2.2 Data Management

The open data policy content concerning data management includes the type and amount of *data processing required before opening the data*. Data is often stripped of personal details and checked in terms of *quality*, including its validity, anonymity, reliability, completeness, representativeness and documentation, before it is opened. The way in which data is processed often influences under which

conditions the end-user can use the data and which *licenses and use conditions* may be needed. For example, if a dataset is completely anonymized and aggregated and the data collection process is well-documented, the user may receive more freedom in reusing the data than for a dataset that contains “rawer” (i.e. unprocessed) data. Open data policies need to define which licenses will apply to the use of the data, as well as the type of information that the user needs to provide before downloading the data. Examples of open data licenses are e.g. the Open Government License UK, Creative Commons (Petychakis, Vasileiou, Georgis, Mouzakitis, & Psarras, 2014) and Open Data Commons (Miller, Styles, & Heath, 2008).

Furthermore, the open data policy encompasses the *number, types or percentages of opened and non-opened datasets* and their related *metadata*, although numbers and types do not say anything about the usefulness and quality of the data. Although this is difficult to measure, the policy can contain a statement about the quality that the data should have when it is collected and before it is opened. Open data policies include *the way that the access* to the data is given. For instance, they show whether the user needs to register or whether the users should accept certain use conditions before the dataset can be downloaded. It also concerns the *data availability*, including the portal where the data can be found. Moreover, the policy content defines the *way of presenting data and metadata to users*, including the technical standards and formats for open data (e.g. CSV or XLS). It refers to the type of metadata that is provided with the data, such as descriptive, contextual and detailed metadata (Jeffery, Asserson, Houssos, & Jörg, 2013; Zuiderwijk, 2015a), as well as the standard that is used to provide the metadata (e.g. CERIF, CKAN or DC) (see Chap. 5). Finally, open data policies include the *frequency of updating data and metadata*.

3.3.3 Stage 3: Policy Implementation: Performance Indicators (Output)

In the third phase of the open data policy cycle, the policy is implemented and enforced. The performance indicators of the open data policy are defined. Performance indicators can be used to evaluate the progress of an open data policy at the fourth stage of the policy making cycle. The policy ideally contains metrics, such as indicators for output steering. Based on the developed policy objectives, indicators may be developed concerning the provision of the data, the use of the data or a combination of those (Susha, Zuiderwijk, Janssen, & Grönlund, 2015) (see Fig. 3.5).

Performance indicators concerning the provision of open data focus primarily on which data is available and in which form. As an example, the Open Data Index produced by the Open Knowledge Foundation focuses on concepts related to data provision, namely: publicly available data, freely available data, data available online, data in machine-readable formats, data available in bulk, up-to-date data, open license, available terms of use, metadata and data quality. Another example concerns the set of open data guidelines created by the Sunlight Foundation. It addresses what data should be public, how to make data public, and how to implement the open data policy (Sunlight Foundation, 2014). This includes principles con-

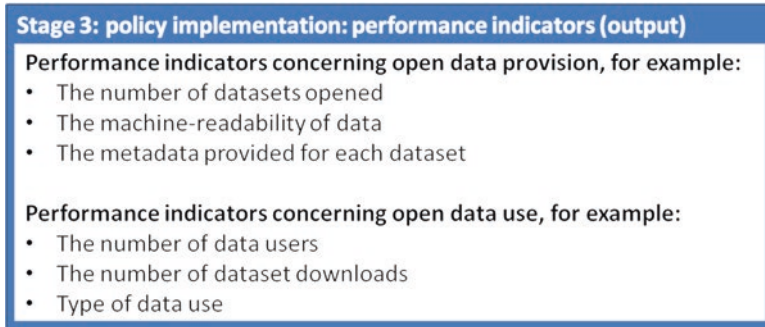


Fig. 3.5 Open data performance indicators (output). (Adapted from Zuiderwijk and Janssen (2014a) and Susha et al. (2015))

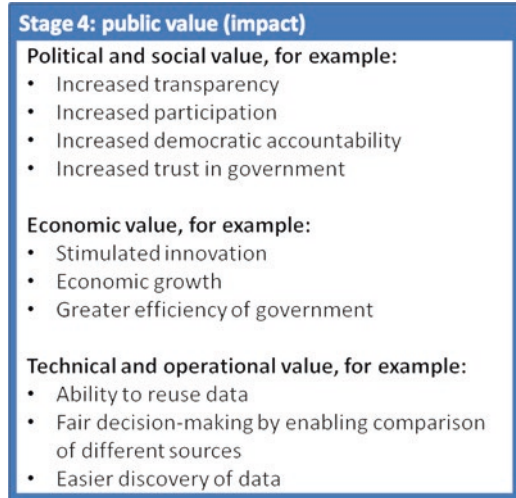
cerning machine-readable formats, the creation of data portals that should provide easy access, and the requirement of publishing metadata (see Chap. 5). The open data policy may include performance indicators concerning data provision such as those provided by the Open Data Index and the Sunlight Foundation.

Performance indicators should not only be focused on the provision of the data, as its use is also of critical importance. *Performance indicators for open data use* focus on actual data use and users. Performance indicators in this area consider numbers and characteristics of open data users, the way that the opened data is used and feedback and interaction between open data users and providers. Since open data is made available to *any* user, the data provider often does not have insight in who uses the data, which complicates setting performance indicators for data use and evaluating to which degree those indicators have been met. Open data use performance indicators usually give a limited view of actual data use. For instance, data users may not be interested in providing feedback concerning the way in which they used a dataset to the data provider, and the number of dataset downloads does not reflect the way in which open datasets have been used.

3.3.4 Stage 4: Evaluation: Public Value Realised? (Impact)

Data providers often want to know the successfulness of their implemented open data policy, which requires evaluation. Ultimately, open data policies meet the set performance indicators. Beyond performance indicators, they realize the benefits that they aim for, contribute to public values and have a large impact on society. The evaluation of impact can be assessed per open data policy, yet it is difficult to assess whether a certain impact has been caused by a certain open data policy. Impact assessment is therefore often focused on consolidating impact evidence from multiple open data policies on a larger scale. The evaluation of implemented open data policy is further complicated as many different stakeholders are involved (e.g. policy makers, data providing organizations, data users) and success may have a different meaning to them.

Fig. 3.6 Open data public value creation (impact). (Adapted from Janssen, Charalabidis, and Zuiderwijk (2012))



Evaluation of realized public value can be done against the objectives set at the first stage of the policy cycle or data providing organizations may be compared to one another through benchmarking. Figure 3.6 provides several examples of open data policy impact. This impact can be in different areas, such as political, social, economic, operational and technical (Janssen et al., 2012).

- *Political and social value.* For instance, open data policies aim to create political and social value by increasing transparency (Kulk & van Loenen, 2012; Welle Donker, van Loenen, & Bregt, 2016; Zuiderwijk, 2015a), increasing participation (Evans & Campos, 2013; Lathrop & Ruma, 2010), increasing democratic accountability (Harrison, Guerrero, et al., 2012), stimulating knowledge development (Chun, Shulman, Sandoval, & Hovy, 2010) and increasing trust in government (Linders, 2013).
- *Economic value.* Examples of economic value include stimulated innovation (Lee & Kwak, 2012; Ubaldi, 2013b), economic growth (Arzberger et al., 2004; Bertot, Jaeger, & Grimes, 2010), greater efficiency of government (Kassen, 2013; Moon, 2002; Welle Donker et al., 2016), and access to external problem-solving capacity and resources (Harrison, Pardo, & Cook, 2012).
- *Technical and operational value.* Examples of operational and technical value concern the ability to reuse data (Ubaldi, 2013b; Yu & Robinson, 2012), fair decision-making by enabling comparison of different sources (Harrison, Guerrero, et al., 2012), easier discovery of data (Villazón-Terrazas, Vilches-Blázquez, Corcho, & Gómez-Pérez, 2011), contribution towards the improvement of administrative processes (Coglianese, 2009; Harrison, Guerrero, et al., 2012; Welle Donker et al., 2016) and use of the wisdom of the crowds: tapping into the intelligence of the collective (Lathrop & Ruma, 2010).

Several benchmarks to evaluate open data policy impact have been developed so far. An example of the evaluation of open data policy impact is the Open Data

Barometer survey carried out by the Web Foundation (Davies, 2013). It uses a crowd sourced survey to assess political, economic and social impacts. Other examples of evaluating impact include analysing log data to obtain more insight in who uses open data (Van Loenen, Ubacht, Labots, & Zuiderwijk, 2017) and creating a network of data providers and companies using open data by the Open Data 500 project, showing which companies use open government data from which sector and from which governmental organization in the United States (GovLab, 2014).

Each benchmark has a different scope, different strengths and weaknesses, and can be used to evaluate different elements of open data policies (Susha et al., 2015). The benchmarks can complement each other (*idem*). Many benchmarks focus on national open data policies, whereas local, regional and international policies are also under development and need to be evaluated.

3.3.5 Stage 5: Policy Change or Termination (Feedback)

The evaluation of open data policies (e.g. through benchmarks) should provide support for improving the existing situation (Susha et al., 2015). Based on the outcomes of the previous stages in the policy making cycle, open data policies can be changed or even terminated. As the field of open data is progressing rapidly, it is important to continuously evaluate the value generated through open data policies and to identify areas for improvement (Susha et al., 2015).

3.4 Directives Promoting Open Data Policy Development

In this section we provide an overview of directives that promote the development of open data policies. As explained before, in addition to published documents, open data policies also concern existing practices. Stimulated by various directives, many open data policies have been developed worldwide. For example, a report of the European Data Portal (2016c) shows that 25 out of the 31 European countries that they investigated have developed a national open data policy. Open data policies that are often seen as important for the boost of the open data movement include those of the European Commission, the United States of America and the Open Government Partnership.

3.4.1 European Commission DIRECTIVE 2003/98/EC

DIRECTIVE 2003/98/EC by the European Commission, the so-called Public Sector Information (PSI) directive, is often seen as the starting point (European Commission, 2003). This document provides “a general framework to ensure fair, proportionate

and non-discriminatory conditions for the re-use of PSI". It states that "Member States shall ensure that, where the re-use of documents held by public sector bodies is allowed, these documents shall be re-usable for commercial or non-commercial purposes" (idem, p. 5). For most European countries their open data policy is similar to the Public Sector Information policy, which is mostly based on the transposition of the revised European PSI Directive. The Directive covers not only written texts, but also databases, audio files and film fragments. It excludes educational, scientific, and broadcasting sectors (European Commission, 2017).

DIRECTIVE 2003/98/EC by the European Commission was complemented by directives and policies in specific sectors (European Commission, 2011c), such as those concerning:

- access to open environmental data (European Commission, 2007, 2016);
- access to open marine data (European Commission, 2010b);
- access to data concerning innovative transport technologies (European Commission, 2010c); and
- access to data concerning cultural heritage material and digital libraries (European Commission, 2011a).

These directives are developing over time and are updated regularly. They provide a general framework to member states for making available particular types of data. For instance, DIRECTIVE 2007/2/EC establishing an Infrastructure for Spatial Information in the European Community (for short, the INSPIRE directive) directs the creation of an infrastructure for spatial information. The above-mentioned directives are often generic without specifying how the envisioned results should be achieved. They provide guidelines or a high-level framework for the development of (more specific) policies.

In 2011, the European Commission updated its open data strategy (European Commission, 2011c). Compared to the 2003 Directive on the re-use of public sector information the following changes were made:

- It was made "a general rule that all documents made accessible by public sector bodies can be re-used for any purpose, commercial or non-commercial, unless protected by third party copyright" (European Commission, 2011c, p. 1);
- The principle was established that "public bodies should not be allowed to charge more than costs triggered by the individual request for data (marginal costs)" (European Commission, 2011c, p. 1) meaning that most data should be offered for free;
- It was made "compulsory to provide data in commonly-used, machine-readable formats, to ensure data can be effectively re-used" (European Commission, 2011e, p. 1);
- These principles were enforced by ensuring regulatory oversight, and also libraries, museums and archives were then included in the reach of the directive (European Commission, 2011e).

Moreover, the European Commission promised to publish its own data through a portal that serves as a single-access point for open data from all EU institutions,

bodies and agencies and national authorities. Former European Commission Vice President Neelie Kroes endorsed this open data policy. She stated: “*We are sending a strong signal to administrations today. Your data is worth more if you give it away. So start releasing it now*” (European Commission, 2011e). The European Parliament formally adopted the amended EU open data policy in June 2013 (European Commission, 2013a).

3.4.2 U.S.A. Memoranda and Directives

In 2009, U.S. President Obama signed and published a Memorandum on Transparency and Open Government (Obama, 2009a). The memorandum is targeted at the American heads of executive departments and agencies. Obama stated: “my Administration is committed to creating an unprecedented level of openness in Government” and “the government should be transparent, participatory and collaborative” (Obama, 2009a, p. 1). In this memorandum the president instructed the Director of the Office of Management and Budget to issue an Open Government Directive, which became available later that year. The Open Government Directive directs executive departments and agencies to take specific actions to implement the principles of transparency, participation, and collaboration as described in the President’s Memorandum, and sets specific deadlines (Obama, 2009b). The directive states that executive departments and agencies should take four main steps toward creating a more open government:

- publish government information online;
- improve the quality of government information;
- create and institutionalize a culture of open government; and
- create an enabling policy framework for open government.

Agencies should produce an action plan that specifies which actions they will undertake to achieve this and by when they will do so.

In 2012, the Obama administration developed a Digital Government Strategy – Building a twenty-first century Platform to Better Serve the American People (Obama, 2012a). This strategy is characterized by Obama’s statement: “I want us to ask ourselves every day, how are we using technology to make a real difference in people’s lives.” The President states that a digital American government should be efficient, effective and focused on improving the delivery of services to the American people. This should be realized by enabling “citizens and an increasingly mobile federal workforce to securely access high quality digital government information, data and services – anywhere, anytime, on any device” (idem, p. 27). Furthermore, to assure that the government adapts to this new digital world, a modern infrastructure should be provided to support digital government efforts and to reduce costs (Obama, 2012a).

3.4.3 *Other Directives and Guidelines for Open Data Policy Development*

Several other important international initiatives that promote open data policy development include the following.

3.4.3.1 Open Government Partnership (OGP)

The Open Government Partnership (OGP) was launched in September 2011 by governments from eight countries (Brazil, Indonesia, Mexico, Norway, the Philippines, South Africa, the United Kingdom and the United States). These countries endorsed the Open Government Declaration and announced their action plans to make their governments more open. In addition to these 8 countries, 67 national governments and 15 subnational governments have joined the OGP since its launch in 2011. Each of them develops a country action plan through public consultation and endorsed the high-level Open Government Declaration. OGP aims at defining concrete government commitments to stimulate transparency, empower citizens, fight corruption, and harness new technologies to strengthen governance (Open Government Partnership, 2017).

3.4.3.2 Open Data Charter

In 2013, the G8 leaders signed an Open Data Charter, consisting of five main principles. All nations involved agreed to establish an expectation that government data should be published openly by default (European Commission, 2013e). Various groups from governments, multilateral organizations, civil society and private sector (including the OGP Open Data Working Group) collaborated to develop the principles further in the following years (Open Data Charter, 2017). In 2015, they agreed on an international Open Data Charter, with six principles for the release of data:

1. Open by Default;
2. Timely and Comprehensive;
3. Accessible and Useable;
4. Comparable and Interoperable;
5. For Improved Governance and Citizen Engagement; and
6. For Inclusive Development and Innovation.

These principles ultimately support open data use. The International Open Data Charter has already been adopted by 47 governments (17 national and 30 local/subnational – as of August 2017). The Charter recommends standardisation of data and metadata, stimulates cultural change, promotes engagement with citizens and civil society and encourages increased attention for data literacy, training programs and entrepreneurship (Open Data Charter, 2017).

3.5 Examples of Open Data Policies at Different Levels

Currently a multiplicity of open data policies and directives are under development at governmental agencies at various administrative levels. Table 3.1 depicts some examples of developed agencies open data policies and directives at international, national, state, regional and local/city level. The final column, containing references to the policy/directive, is also an example. Usually a policy is not described in one single document, but information about the actual policy needs to be obtained from multiple sources. The policies are diverse and support open data publication and use in different ways. From the table below, we can conclude that open data policies are under development all over the world and at a variety of administrative levels.

Table 3.1 Examples of developed open data policies and directives

Open data policy/directive level	Geographical area that the open data policy/directive applies to	Example of developed open data policy/directive	Reference to policy/directive
International	European Commission	DIRECTIVE 2003/98/EC	European Commission (2003), European Commission (2013c)
	United Arab Emirates	Open Data Policy	United Arab Emirates – Federal Customs Authority (2016)
National	India	Open Data Policy (NDSAP) of India	Digital India (n.d.)
	Brazil	Practical manual of the Transparency Portal of the Federal Government	Governo Federal (2010)
	Kenya	Government of Kenya open data initiative	Kenya ICT Board (2017)
State	New South Wales, Australia	Open data policy	State of New South Wales – Department of Finance (2016)
Regional	Province of Utrecht, the Netherlands	Utrecht Open Data	Province Utrecht (2017)
	Catalonia, Spain	Partnership Agreement between the Government of Catalonia and the Wikimedia Amical association	Generalitat de Catalunya (2017)
Local/city	New York, U.S.A.	Open data policy and technical standards manual	City of New York (2016)
	Chicago, U.S.A.	Open Data Executive Order (No. 2012–2)	City of Chicago (2012)

3.6 Use Case: The Dutch Open Data Policy

In this section we used the elements of open data policies as described at the beginning of this chapter to analyse the national open data policy of the Netherlands. This policy has been described in a variety of documents, complemented with information obtained from open data portals, discussions with civil servants responsible for Dutch open data policies at different levels and organizations, and practical experience. Table 3.2 depicts the main characteristics of the Dutch national open data policy.

The social, political, economic, and regulatory context shape the Dutch open data policy. Policymaking in the Netherlands is consensus-based (Pollitt & Bouckaert, 2011). Pollitt and Bouckaert write that, compared to other countries, “Dutch ministries are relatively open organizations” (p. 271). This is influenced by the Dutch system that allows for consultative and advisory councils (Pollitt & Bouckaert, 2011). The Netherlands is a decentralized unitary constitutional state based on a parliamentary democracy (Pollitt & Bouckaert, 2011). The Netherlands has a Gross Domestic Product (GDP) of 770.845 billion dollar in 2016, compared to for instance 18.596 trillion in the United States and 2.619 trillion in the United Kingdom (The World Bank, 2016).

Several strategies, laws, letters, action plans and vision statements form the regulatory context of the Dutch open data policy. The EU strategy forces the development and implementation of a national open data policy (European Commission, 2013c). In addition, a National Open Data Agenda has been developed (Ministerie van Binnenlandse Zaken en Koninkrijksrelaties, 2016). Legislation that has been developed in this area includes:

- Law Reuse of Government Information – Wet Openbaarheid van Bestuur. Opening data on request, Freedom of Information Legislation.
- Law Openness of Public Administration – Wet Hergebruik Overheidsinformatie). Actively opening data.
- Law Open Government (Wet Open Overheid) – currently handled by the Upper House of Dutch Parliament.

The Netherlands has joined the Open Government Partnership and developed an action plan (Ministerie van Binnenlandse Zaken en Koninkrijksrelaties, 2013a), a Vision Open Government (Ministerie van Binnenlandse Zaken en Koninkrijksrelaties, 2013b) and the Minister of the Interior sent the Second Chamber several letters concerning the government’s open data policy (Ministerie van Binnenlandse Zaken en Koninkrijksrelaties, 2017c). All these documents contain information concerning the elements of the Dutch national open data policy.

Furthermore, the policy environment of the Dutch open data policy is characterized by a population of about ~17 million inhabitants. Cultural characteristics concern the low power distance (being independent, hierarchy for convenience only, equal rights, direct and participative communication), a relatively individualist society (loosely-knit social framework of individuals), a relatively feminine society

Table 3.2 Policy environment characteristics of the Dutch open data policy

Policy elements	National open data policy of the Netherlands	
Stage 1: Policy environment	Social context	Polymaking is consensus-based and governmental organizations are relatively open (Pollitt & Bouckaert, 2011)
	Political context	Decentralized unitary constitutional state, based on a parliamentary democracy (Pollitt & Bouckaert, 2011)
	Economic context	GDP: 770,845 billion dollar in 2016 (The World Bank, 2016)
	Legislation and regulatory context	EU strategy (European Commission, 2013c) National Open Data Agenda (Ministerie van Binnenlandse Zaken en Koninkrijksrelaties, 2016) Laws (including the Law Reuse of Government Information, Law Openness of Public Administration and Law Open Government (the latter is under review) Open Government Partnership (OGP) Action plan for OGP (Ministerie van Binnenlandse Zaken en Koninkrijksrelaties, 2013a) Vision Open Government (Ministerie van Binnenlandse Zaken en Koninkrijksrelaties, 2013b) Letters sent by the Minister of the Interior to the Second Chamber (Ministerie van Binnenlandse Zaken en Koninkrijksrelaties, 2017c)
	Culture and country	~17 million inhabitants. Cultural characteristics: low power distance, individualist society, feminine society, slight preference for avoiding uncertainty (Hofstede, 2001; Hofstede, Hofstede, & Minkov, 2010; Hofstede Insights, 2017)
	Geographic level	Country (national)
	Type of data providing organizations	Ministries, provinces, municipalities, and other governmental organizations
	Key motivations and policy objectives	Open data is beneficial to the society Open government data stimulate private organizations, innovation, new business models and employment Insights in the available data and information of the government can contribute to cost reductions and improving policy processes (Ministerie van Binnenlandse Zaken en Koninkrijksrelaties, 2016, p. 1)
	Mission type	Mainly strategic, focus on transparency and democratic accountability (Ministerie van Binnenlandse Zaken en Koninkrijksrelaties, 2016)
	Available resources	Human resources and IT resources (Ministerie van Binnenlandse Zaken en Koninkrijksrelaties, 2016)
	Available open data platform	One national open data portal has been developed: data.overheid.nl At the same time various other open data portals are available, e.g. for specific ministries or domains (e.g. geographical data or social science data).
	Resource allocation	Human resources: at the national level to support the opening process (for questions concerning technology, organization and licenses) IT resources: a national portal

(important to keep the life/work balance) and a slight preference for avoiding uncertainty (Hofstede, 2001; Hofstede et al., 2010; Hofstede Insights, 2017).

The national open data policy is developed at the central level of government, under responsibility of the Ministry of the Interior and Kingdom Relations, yet other governmental organizations, including ministries, provinces and municipalities are also developing their own policies. At the national level, the policy is mainly strategy, as it focuses on transparency and democratic accountability (Ministerie van Binnenlandse Zaken en Koninkrijksrelaties, 2016). Key motivations and policy objectives are: “The society can profit from open data. Governmental data stimulate private organizations and stimulate innovation, new business models and employment. Insights in the available data and information of the government can contribute to cost reductions and improving policy processes.” (Ministerie van Binnenlandse Zaken en Koninkrijksrelaties, 2016, p. 1).

Human resources are available at the national level to support the opening process (for questions concerning technology, organization and licenses). Regarding available Information Technology (IT) resources, a national portal is available, namely data.overheid.nl. Yet, many organizations and domains develop their own portals (e.g. one portal for geographical data and one portal per municipality), and various datasets are available at multiple places. For instance, open data portals are available for specific ministries and domains (e.g. geographical data or social science data) (Table 3.3).

The policy content is first characterized by the policy strategy and principles. The basic principle of the Dutch open data policy is to open data by default (Ministerie van Binnenlandse Zaken en Koninkrijksrelaties, 2016). Each department is responsible and accountable for the execution and approach of opening its data, coordinated under the supervision of the ministry of the Interior and Kingdom Relations (idem). The main actors involved in developing the Dutch open data policy are governmental organizations collecting and creating data and Information Technology (IT) providers. Targeted users are particularly citizens and entrepreneurs, although anyone can use government data. Through the national portal (data.overheid.nl) data is made available to users concerning a variety of themes: administration, culture and recreation, economy, finance, housing, international, agriculture, migration and integration, nature and environment, education and science, public order and safety, law, space and infrastructure, social security, traffic, work, care and health. Privacy sensitive data, other sensitive data and other data that is not appropriate for opening remains closed. Regarding the open data measures and instruments, the Dutch national open data policy defines three focus areas:

- Incentivisation and disclosure of datasets – focused on numbers and prioritization of datasets
- Progress monitoring and quality. Contains measures to monitor the quality of the metadata and the progress of disclosing data.
- Supporting the disclosure, technology and users – offers help to data managers. Collects wishes and questions of data users (Ministerie van Binnenlandse Zaken en Koninkrijksrelaties, 2016).

Table 3.3 Policy content characteristics of the Dutch open data policy

Policy elements	National open data policy of the Netherlands
Stage 2: Policy strategy and principles	Open by default (Ministerie van Binnenlandse Zaken en Koninkrijksrelaties, 2016)
Actors involved in opening data	Governmental organizations collecting and creating data, IT providers
Targeted open data users	Anyone, but particularly citizens and entrepreneurs
Types of data opened and not opened	Data opened concerning many different topics (e.g. administration, culture and recreation, economy, finance, housing, international, agriculture, migration and integration (see data.overheid.nl)) Data not opened: (privacy) sensitive data, data that is not appropriate for opening.
Policy measures and instruments	Three focus areas: (1) incentivisation and disclosure of datasets, (2) progress monitoring and quality, (3) supporting the disclosure, technology and users (Ministerie van Binnenlandse Zaken en Koninkrijksrelaties, 2016)
Provision of (technical) support for opening data	Support for questions concerning technology, organization and licenses (Ministerie van Binnenlandse Zaken en Koninkrijksrelaties, 2016)
Provision of (technical) support for open data use	User group to discuss operational and user barriers (Ministerie van Binnenlandse Zaken en Koninkrijksrelaties, 2016)
Type of engagement of and interaction between data providers and users	Meetings between open data programme employees, data providers and data users, e-mail and data request forms (Data.overheid.nl, 2017a).
Promotion of data and metadata	Promotion through social media, hackathons, user group meetings
Data processing before opening	Open data should be provided as raw as possible (Data.overheid.nl, 2017c)
Data quality	The organization owning the dataset is responsible for data quality aspects when opening and maintaining the data (Ministerie van Binnenlandse Zaken en Koninkrijksrelaties, 2016).
Selected open data license and use conditions	Various licenses used (Algemene Rekenkamer, 2016)
Data and metadata provision	Data offered through national data portal. Possible to search data sets, download data sets, CKAN API accessible for data uploading and downloading (Data.overheid.nl, 2017b), possibility to give feedback, not possible to contribute to the data portal directly (European Data Portal, 2016a).
Numbers or percentages of opened datasets	11,676 datasets available (September 2017). Out of these datasets, 38% is provided by Statistics Netherlands and 43% is provided by the National Geo Register.
Data access and availability (e.g. required registration, portal)	Data offered through various portals, often duplicated. Registration or login is usually not required.
Way of presenting data and metadata to users (e.g. formats, standards)	National portal realized using CKAN. Various (inter)national metadata standards used, including OWMC (derived from DC) (Standaarden.overheid.nl, 2017) and DCAT-AP-NL (World Wide Web Consortium, 2014).
Data update frequency	Differs per data provider and portal

Technical support is available for governmental organizations wishing to open up their data through the national open data portal data.overheid.nl. Support is given for questions concerning technology, organization and licenses (Ministerie van Binnenlandse Zaken en Koninkrijksrelaties, 2016). A user group has been set up to provide feedback to the national open data portal. The user group is open and meets several times per year (Ministerie van Binnenlandse Zaken en Koninkrijksrelaties, 2016). The ministry of the Interior and Kingdom Relations organizes several events each year, including meetings with users ('gebruikersgroep bijeenkomsten') several times per year. In addition, interaction is possible through e-mail and by filling out a data request form on the national open data portal (Data.overheid.nl, 2017a). The user of governmental data is promoted through Twitter, hackathons and user group meetings. Tweets about the Dutch open data policy appear frequently, and hackathons and user group meetings are organized several times per year. Hackathon are usually thematic, focusing on, for example, climate data, agriculture data or road infrastructure data.

According to the guideline of the Dutch federal government, open data should be open, without payment, available "as-is", free of rights, accessible without registration, computer processable, provided with metadata, complete, as raw as possible, timely and findable (Data.overheid.nl, 2017c). The organization owning the dataset is responsible for data quality aspects when opening and maintaining the data. This includes timeliness, accuracy, completeness, topicality and consistency of the data (Ministerie van Binnenlandse Zaken en Koninkrijksrelaties, 2016). In 2015, the Second Chamber called for more attention for data quality aspects (Second Chamber, 2015). The license used differs per dataset. Datasets are published both with open and more restricted licenses (Ministerie van Binnenlandse Zaken en Koninkrijksrelaties, 2016).

Data is offered through national data portal. It is possible to search and download data sets, and a CKAN API is accessible for data uploading and downloading (Data.overheid.nl, 2017b). It is possible to give feedback regarding datasets or the data portal, but it is not possible for data providers or users to contribute to the data portal directly (European Data Portal, 2016a). In total, 11,676 datasets were available in September 2017. Out of these datasets, 38% is provided by Statistics Netherlands and 43% is provided by the National Geo Register. Data is not only offered through the national open data portal, but also through other portals, resulting in fragmentation. Registration is usually not required, in line with the national guidelines.

The national open data portal has been realized using the Comprehensive Knowledge Archive Network (CKAN), which is also used for open data portals in several other European countries. The national portal offers data in many different formats (see Algemene Rekenkamer (2016) for an overview). Various (inter)national standards are used to present the data on the national data portal, including:

- Overheid.nl Web Metadata Standaard (OWMS). This national standard is derived from the international Dublin Core (DC) standard (Standaarden.overheid.nl, 2017).
- Data Catalog Vocabulary (DCAT). This international standard allows for the exchange of datasets between data registers (World Wide Web Consortium, 2014).

Table 3.4 Policy environment characteristics of the Dutch open data policy

Policy elements		National open data policy of the Netherlands
Stage 3: Policy implementation	Performance indicators concerning open data provision (e.g. number of datasets opened, machine-readability of data)	<p>Performance for open data provision is measured in various ways, e.g.:</p> <ul style="list-style-type: none"> The number of opened datasets compared to the number of available datasets (Ministerie van Binnenlandse Zaken en Koninkrijksrelaties, 2017b) The opening of municipal high-value datasets (Ministerie van Binnenlandse Zaken en Koninkrijksrelaties, 2017a) The scores in international benchmarks: the Open Data Barometer (World Wide Web Foundation, 2016), the European Open Data Benchmark (European Data Portal, 2016b) and the Global Open Data Index (Open Knowledge International, 2016) Research by the National Audit office (Algemene Rekenkamer, 2015, 2016).
	Performance indicators concerning open data use (e.g. the number of data users, number of dataset downloads, type of data use)	<p>Performance for open data provision is measured mainly by.:</p> <ul style="list-style-type: none"> The scores in international benchmarks: the Open Data Barometer (World Wide Web Foundation, 2016), the European Open Data Benchmark (European Data Portal, 2016b) and the Global Open Data Index (Open Knowledge International, 2016) Research by the National Audit office (Algemene Rekenkamer, 2015, 2016).

The data update frequency differs per dataset and data provider (Table 3.4).

The performance of the Netherlands in opening its data is measured in various ways. First, since 2015, an annual ‘data inventory’ is carried out, aimed at identifying all available datasets within governmental organizations and at examining which datasets are appropriate for opening. An inventory template has been developed and the inventory process is open and available as open data. An inventory is made for ministries, municipalities, provinces and district water boards. The number of opened datasets is compared to the number of available datasets (Ministerie van Binnenlandse Zaken en Koninkrijksrelaties, 2017b). The results of the inventory are reported on a dedicated website (<https://data.overheid.nl/data-inventarisatie>) and in a letter to the Second Chamber (Minister of the Interior and Kingdom Relations, 2017). Second, municipal high value datasets have been identified (Ministerie van Binnenlandse Zaken en Koninkrijksrelaties, 2017a). The list of high value datasets should help municipalities in prioritizing the opening of certain datasets. Third, the progress in opening data and use is monitored by examining the scores of international benchmarks: the Open Data Barometer (World Wide Web Foundation, 2016), the European Open Data Benchmark (European Data Portal, 2016b) and the Global Open Data Index (Open Knowledge International, 2016). In addition, the National

Table 3.5 Policy evaluation characteristics of the Dutch open data policy

Policy elements		National open data policy of the Netherlands
Stage 4: evaluation: public value realized?	Political and social value (e.g. increased transparency)	Scores in international benchmarks: The Open Data Barometer, ranked #8 (World Wide Web Foundation, 2016) The European Open Data Benchmark, the Netherlands is viewed as a ‘trendsetter’ (European Data Portal, 2016a) The Global Open Data Index, ranked #20 (Open Knowledge International, 2016)
	Economic value (e.g. economic growth)	Unknown
	Technical and operational value (e.g. ability to reuse data)	Data inventory findings are available No monitoring of the opening of municipal high value datasets so far Many missed opportunities, many more datasets can be opened (Algemene Rekenkamer, 2015, 2016).

Audit Office examines the Dutch open data progress (Algemene Rekenkamer, 2015, 2016) (Table 3.5).

Regarding the political and social value, the scores of international benchmarks are reported. The Netherlands is ranked place 8 in the Open Data Barometer (World Wide Web Foundation, 2016). Out of the maximum score of 100 points, the economic impact receives a score of 47, the political impact a score of 63 and the social impact a score of 50 (World Wide Web Foundation, 2016). According to the European Open Data Benchmark, the Netherlands can be viewed as a ‘trendsetter’, together with countries like the United Kingdom, France and Finland (European Data Portal, 2016a). The Netherlands is ranked place 20 in the Global Open Data Index (Open Knowledge International, 2016). The Dutch open data policy has a score of 54% out of the maximum score of 100%. 40% of the defined data types is open as defined by the Open Definition (Open Knowledge International, 2016). At the same time one should keep in mind that each benchmark uses different indicators and each of them has its advantages and disadvantages (Susha et al., 2015).

Information regarding the created economic value is lacking. As far as the technical and operational value are concerned, the number of available datasets compared to the number of opened datasets is reported at <https://data.overheid.nl/rijksbrede-inventarisatie-2017>. It is also reported how many datasets cannot be opened because of, for instance, privacy concerns and how many datasets are still under investigation. The National Audit Office states that there are many missed opportunities (Algemene Rekenkamer, 2015, 2016). Not so many new datasets have been opened recently (only datasets already available at other portals have been copied to the national portal), whereas many datasets can still be opened (Algemene Rekenkamer, 2016). There is also no process of monitoring the opening of municipal high value datasets in place at the moment, although the high value list has only been created in 2016 (Table 3.6).

Table 3.6 Policy change/termination characteristics of the Dutch open data policy

Policy elements	National open data policy of the Netherlands
Stage 5: policy change or termination	Gradual development of open data policy. Several policy documents have been developed. Ministerie van Binnenlandse Zaken en Koninkrijksrelaties (2017c) provides an overview.

The Dutch national open policy is in place for several years now and improvements are gradually being made. So far, the policy has not been changed considerably, yet it has been made more specific and detailed (e.g. by adding more specific overviews of how many datasets are available through the data inventories), and it has expanded (e.g. by also providing data of more municipalities and provinces through the national open data portal and by connecting to Statistics Netherlands and the national Geo Register). Open data will remain an important focus area for the Dutch government in the following years, as indicated by the government that was formed in 2017: “The government own considerable general, public information. This data will be made findable and accessible in the form of open data” (Bureau Woordvoering Kabinetsformatie, 2017, p. 7).

3.7 Conclusions and Lessons Learned Concerning Open Data Policies

In this chapter we looked into open data directives and policies. Directives promote the development of open data policies and provide a high-level framework. We provided examples of elements of directives and policies, we discussed existing open data directives and policies, we provided an example of the elements of the Dutch national open data policy, and we discussed lessons learned from open data policy development. This chapter provided us with various lessons that can be learned concerning open data policies in general. First, several frameworks for comparing open data policies have already been developed, and they show that a wide variety of open data policies exist. Existing policies have a different focus and open data policies may encompass different elements. The elements of open data policies that we described in this chapter are not covered by every policy. There is variety in the policy environment and context, the policy content (the input), the performance indicators (the output), the attained public values (the impact) and policy change or termination (the feedback). The differences between open data policies may indicate that open data policies stimulate the provision and use of open data in different ways, and this could reveal opportunities for learning from each other (Zuiderwijk & Janssen, 2014a).

Open data policies may not only include statements in documents, but also the actual behaviour and practice of governments. Often this is overlooked. Open data policies should not only focus on the opening of data, but they should pay special attention to improving the use of and value creation with open data. Open data poli-

cies have been developed all over the world, both in developed and in developing countries (Nugroho, Zuiderwijk, Janssen, & de Jong, 2015) and at different administrative levels (international, national, state, regional, local – see Table 3.1). There is no best policy, as open data policies depend on the context in which they are created and on the policy objectives.

Open data policies can also be criticized for several reasons. As an example, open data policies are usually formulated on a high level of abstraction. They are often not very specific, since they also need to leave enough freedom for interpretation and application, which can make it difficult for those who need to implement the policy to use the policy as a guideline. Another example is that the user perspective is often lacking in open data policies. Open data policies are usually focused on what governments aim to achieve and how they want to do this, but they often lack the mechanisms that are required to identify and address the need of open data users, although more the user perspective is being acknowledge increasingly.

Moreover, having a policy in place does not necessarily mean that this policy will be implemented. Policy makers need to be aware that merely the design of open data policies is not enough, and additional measures are required. For example, governmental agencies may not be motivated to open up governmental data or they may not have the necessary resources to do so, which could lead them to ignore the design policies. It is also possible that government agencies that collect and hold data are not aware of the develop policies and the requirement to open up their data, or they may not know how to design processes required for opening up data within their organization. Open data is a quickly developing field that is influenced by developments in related fields, such as EU General Data Protection Legislation (GDPR). New legislation may make government agencies reluctant to open up their data, since it may not yet be clear how the new legislation should be interpreted in context of their organization. A lack of stability and reliability of legal frameworks are not only likely to lead to less opening up of governmental data, but in combination with other barriers (e.g. the low quality of data released) they are also likely to lead to less open data usage.