

Brave New Open Data World?

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Abstract

There is a growing tendency to release all sorts of data on the Internet. The greater availability of interoperable public data catalyses secondary use of such data, which leads to growth of information industries and better government transparency. Open data policies may at the same time be in conflict with the individual's right to information privacy as protected by the EU Privacy Directive. This directive sets rules to the *processing of personal data*. Technological developments and the increasing amount of publicly available data are, however, blurring the lines between non-personal and personal data. Open data does not seem to be personal data on first glance because it is anonymised or aggregated. However, it may become personal data by combining it with other publicly available data. In this article, we argue that these developments extend the reach of EU privacy regulation to open data and may obstruct the implementation of open data policies in the EU.

1. Introduction: Open data

There is a growing tendency to release all sorts of data on the Internet. Both regional, national and local governments are opening up and allow individuals and companies to freely re-use public data for their own purposes, often referred to as 'open data'. Such data could, for instance, concern: crime statistics, energy consumption, addresses in a trade register and issued construction permits. A large majority of this data relates to locations on earth; so-called geographic data.

The European Union advocates the re-use of public data through the Directive on the Re-use of Public Sector Information.¹ European Commissioner Kroes has said that she is a fan of open data² and the Commission has put out a tender for an open data portal.³ Hopes are that the greater availability of interoperable public data catalyses secondary use of such data, which leads to growth of information industries and better government transparency. The re-use of public data has great commercial potential. The total value

¹ Directive 2003/98/EC of the European Parliament and of the Council of 17 November 2003 on the re-use of public sector information (OJ L 345/90). Also see: A Digital Agenda for Europe (COM(2010) 245 final/2).

² <http://blogs.ec.europa.eu/neelie-kroes/public-data-for-all---opening-up-europes-public-sector>

³ http://ec.europa.eu/information_society/policy/psi/open_data/call_tenders/index_en.htm

of re-use of information collected by European public bodies is estimated at between 27 billion (Dekkers et al. 2006) and 68 billion euro (Pira International 2000).

Open data policies may at the same time be in conflict with the individual's right to information privacy as protected by the EU Privacy Directive. This directive sets rules to the *processing of personal data*. Technological developments and the increasing amount of publicly available data are, however, blurring the lines between non-personal and personal data. Open data does not seem to be personal data on first glance because it is anonymised or aggregated. However, it may become personal data by combining it with other publicly available data. These developments extend the reach of EU privacy regulation to open data and could in effect obstruct the implementation of open data policies in the EU.

This article elaborates on the impact privacy legislation in Europe may have on open government data initiatives and policies.

2. Open government data

There exist many definitions of open data or open government data. Here we follow the definitions of the open government data working group (see <http://opengovernmentdata.org>). This group of 30 experts agreed on the following 9 principles. Government data shall be considered open if the data are made public in a way that complies with the principles below:

1. Data Must Be Complete

All public data are made available. Data are electronically stored information or recordings, including but not limited to documents, databases, transcripts, and audio/visual recordings. Public data are data that are not subject to valid privacy, security or privilege limitations, as governed by other statutes.

2. Data Must Be Primary

Data are published as collected at the source, with the finest possible level of granularity, not in aggregate or modified forms.

3. Data Must Be Timely

Data are made available as quickly as necessary to preserve the value of the data.

4. Data Must Be Accessible

Data are available to the widest range of users for the widest range of purposes.

5. Data Must Be Machine processable

Data are reasonably structured to allow automated processing of it.

6. Access Must Be Non-Discriminatory

Data are available to anyone, with no requirement of registration.

7. Data Formats Must Be Non-Proprietary

Data are available in a format over which no entity has exclusive control.

8. Data Must Be License-free

Data are not subject to any copyright, patent, trademark or trade secret regulation. Reasonable privacy, security and privilege restrictions may be allowed as governed by other statutes.

9. Compliance must be reviewable.

A contact person must be designated to respond to people trying to use the data and to respond to complaints about violations of the principles. An administrative or judicial court must have the jurisdiction to review whether the agency has applied these principles appropriately.

In addition to the principles of the open government data working group we add a 10th principle from the Open Knowledge Foundation (see <http://opendefinition.org/okd>):

10. The work shall be available as a whole and at no more than a reasonable reproduction cost, preferably downloading via the Internet without charge.

3. Privacy protection in the European Union: the EU Privacy Directive

Alan Westin laid the foundation of our modern conception of information privacy, which focuses on the individual's right to control what is known about him (Westin 1967). The modern right to information privacy still leans on the notion of privacy as a right to control one's personal information. Article 12 of the Universal Declaration of Human Rights reads: "No one shall be subjected to arbitrary interference with his privacy, family, home or correspondence, nor to attacks upon his honour and reputation." Article 8 of the Charter of Fundamental Rights of the European Union gives everyone the right "to the protection of personal data concerning him or her". The automated processing of personal data is also bound to the Council of Europe's Convention for the Protection of Individuals with regard to Automatic Processing of Personal Data. This fundamental right to information privacy is further elaborated by the EU Data Protection Directive.

The EU data Protection Directive applies to the processing of personal data. When personal data is processed, it should be processed fairly and for specified, explicit and legitimate purposes.

4. The concept of personal data

The EU Privacy Directive defines *personal data* as “information relating to an identified or identifiable natural person”. An identifiable person is “one who can be identified, directly or indirectly, in particular by reference to an identification number or to one or more factors specific to his physical, physiological, mental, economic, cultural or social identity” (Article 2(a) of the EU Data Protection Directive).

Typical examples of information that relates to a person and thus is personal data are names, (e-mail/IP) addresses and telephone numbers. Personal data is, however, more than just names and addresses. The Article 29 Working Party, which is the group of European Data Protection Agencies, emphasizes the purpose or result that information has, in order to determine whether information is personal data: “data relates to an individual if it refers to the identity, characteristics or behaviour of an individual or if such information is used to determine or influence the way in which that person is treated or evaluated” (Article 29 Working Party 2005, p. 8).

Personal data includes any sort of statement about a person. Not only objective information is included, also subjective information. The information does not need to be true. The statement that ‘Titius is a reliable borrower’ is personal data, even if Titius proves to be an unreliable borrower (Article 29 Working Party 2007, p. 6).

On some occasions information concerning objects can be personal data. Objects usually belong to someone. For instance, the value of a house is information about an object to which on first glance data protection rules do not apply. However, houses are assets of their owners and their value can be used to for instance determine the extent a person’s obligation to pay taxes. In this context, the value of a house becomes personal data to which the European Data Protection Directive applies (Article 29 Working Party 2007, p. 9).

The assessment whether data should be considered personal data depends also on how easy it is to link data to a person (recital 26 of the EU Privacy Directive). The stage of technological development is an important measure in this assessment. Data that today is considered not to be personal data may next year very well be personal data. Simply because technology has advanced. One example may be the publication on the Internet of a picture including anonymous individuals. Ten years ago, it was almost impossible to uncover the identity of the people in the picture (thus no personal data). Today, however, image recognition software allows to identify these people with a simple mouse click (thus personal data). Since data on the Internet is forever one may argue that any data that potentially can be linked to individuals, despite the current stage of technological advances, should be considered and treated as personal data.

The legislative history of the legislative process for implementing the EU Privacy Directive in Dutch legislation shows this development nicely. First, in 1998 ownership and value information of real estate was not considered personal data (Tweede Kamer 1997-1998, 25892, nr. 3). Also in 1998, data at the zip-code level was not considered to be personal data (Kamerstukken 25892 no. 6). However, in 1999, it was argued that data at the ZIP-code level (6PPC) (see Kamerstukken 25892 no. 92c) and ownership and value information of real estate should be considered personal data (Tweede Kamer 1998-1999, 25892, nr. 9).

Processing personal data requirements

If personal data is processed then the EU Privacy Directive provides the requirements that need to be fulfilled.

For data quality, the EU Privacy Directive rules that personal data should be collected for specified, explicit and legitimate purposes and not further processed in a way incompatible with those purposes (Article 6(1)(b) EU Privacy Directive). The processing should further be adequate, relevant and not excessive in relation to the purposes for which they are collected and/or further processed (Article 6(1)(c) EU Privacy Directive).

The controller must also ensure that the processing of personal data is accurate and, where necessary, kept up to date; every reasonable step must be taken to ensure that data which are inaccurate or incomplete, having regard to the purposes for which they were collected or for which they are further processed, are erased or rectified (Article 6(1)(d) EU Privacy Directive).

Finally, the personal data must be kept in a form which permits identification of data subjects for no longer than is necessary for the purposes for which the data were collected or for which they are further processed (Article (6)(1)(e) EU Privacy Directive).

5. Is open data personal data?

Train times, the location of public toilets and the number of car accidents could all be open data. No open data provider is likely to offer names, addresses, social security numbers, or other data that directly or indirectly identifies natural persons as open data. Open data (ideally) is at the most anonymised or aggregated data that cannot be related to individuals. The Open Knowledge Foundation visualizes open data and “private data” as two non-overlapping subsets. Unfortunately, in reality this distinction is not so easy to draw. Even when data has been anonymised or aggregated, data analysis techniques now allow us to re-identify individuals in such data (Ohm 2010). This is not just a theoretical problem.

When AOL released 650,000 pseudonymised search queries, two New York Times journalists showed that some search queries could be related to a particular individual

(Barbaro and Zeller 2006). The journalists had uncovered the identity of 62-year old widow Thelma Arnold living in Lilburn, Ga., USA. She searched for topics ranging from “numb fingers” to “60 single men” to “dog that urinates on everything”. The widow’s identity could be revealed because she had searched for people with the last name Arnold, and issues relating to her hometown.

Another example is the Netflix-case. Netflix offered anonymised data for a contest to improve its movie recommendations. Researchers showed that this data could in fact be used to identify Netflix subscribers (Narayanan and Shmatikov 2008). The researchers demonstrated that that an attacker who knows only a little bit about an individual Netflix subscriber can easily identify this subscriber’s record in the dataset. Using the Internet Movie Database as the source of background knowledge, Narayan and Shmatikov successfully identified the Netflix records of known users, uncovering their apparent political preferences and other potentially sensitive information.

In particular regarding open data, one research project demonstrated that it is relatively easy to link open data to individuals. Students uncovered names and addresses of councillors, and names, posts and salaries of senior public servants by combining data from the British open data portal with other already available public data (Simpson 2011).

A study of the 1990 US census data showed that 87% of the US population could be identified based on only gender, 5-digit ZIP code and full date of birth (Sweeney 2000). A similar study was conducted on the 2000 US census data, which made clear that 63% of the US population could be identified by only those same characteristics (Golle 2006).

These examples teach us that anonymised or aggregated data that is non-identifiable today, may turn out to be indirectly identifiable tomorrow. In the case of AOL, one could say that the dataset should have been better anonymised by, for instance, removing names and other identifying information from the search queries. However, in the cases of Netflix and the British open data portal, combining the datasets with already available information lead to identification of individuals in certain data. This would have been difficult to prevent.

The risk of de-anonymisation or de-aggregation of data will only grow as computing power increases and more data becomes publicly available. Does this mean that anonymised or aggregated open data is or will become personal data? The answer to this question depends on two issues.

Firstly, according to recital 26 of the EU Privacy Directive, all the means likely reasonably to be used to identify the said person should be taken into account to determine whether a person is identifiable. The EU Privacy Directive does not apply to data that is rendered anonymous in such a way that the person is no longer identifiable. According to the Article 29 Working Party, the assessment of whether data allows identification of an individual, and whether the information can be considered as anonymous or not depends on the circumstances of the case. A case-by-case analysis

should be carried out with particular reference to the extent that the means are likely reasonably to be used for identification (Article 29 Working Party 2007, p. 21).

Secondly, in order for open data to be personal data, the data in its de-anonymised or de-aggregated form should relate to an individual. For instance, de-aggregated data that relates to the number of house sparrows in a certain area will most likely not relate to individuals will not be personal data. On the contrary, if the de-anonymised or de-aggregated data relates to the value of a specific real estate or the use of electricity on household level, the data has to be considered personal data.

Whether open data is personal data depends on the specific circumstances of a particular case. In the case of the Netflix-prize, researchers managed to uncover sensitive information such as political preferences. Such information should be considered personal data under the EU Privacy Directive since Article 8(1) of the directive explicitly prohibits the processing of special categories of personal data such as “political opinions”. Because the information was uncovered by two leading computer scientists and the directive applies to information that can be identified by “all the means likely reasonably to be used”, it is unsure whether, at this moment, the information is really personal in the sense of the directive. This was different in the case of the British open data-case, in which, compared to the researchers in the Netflix case, less skilled students uncovered names, addresses and salaries.

6. Open data is personal data, now what?

Processing of personal data is not by definition unlawful. The EU Privacy Directive requires that if personal data is processed, it should be done fairly and for specified, explicit and legitimate purposes (Article 6 of the EU Privacy Directive). The purposes for which the data is processed must be explicit and legitimate and must be determined at the time of collection of the data (Recital 28 of the EU Privacy Directive).

Especially the requirement of ‘specified’ purposes will give rise to problems when open data is personal data. The purpose of open data policies is to allow access and re(use) of data without any or with very few limitations. In our view, unconditional (re)use of data is not specific enough to fulfil the requirement of the processing having a specific purpose. The requirement of a specific purpose protects data subjects as it requires data processors to limit the purposes of the data processing. It furthermore allows data subjects to gain insight into what is done with data that relates to them. A purpose that is as broad as the open data purpose is in fact a blank cheque and does not allow data subjects to know or control what their data is used for.

The processing of certain special types of personal information is in principle prohibited. This is the case when the processing of the information reveals racial or ethnic origin, political opinions, religious or philosophical beliefs, trade-union membership, and information concerning health or sex life (Article 8(1) EU Privacy Directive).

This prohibition may also be a problem for open data-providers that want to offer aggregated data concerning, for instance, political opinions in certain neighbourhoods. If the data can be de-anonymised or de-aggregated then sensitive personal data is processed, which is unlawful according to the EU Privacy Directive.

7. Conclusion

Open data policy catalyses the sharing of geographic data, which brings great economic benefits and could help make government institutions more transparent. However, at the same time open data puts the right to information privacy under pressure and will increasingly do so as technology progresses and more data becomes publicly available.

Directly identifying data, such as names, social security numbers and credit card numbers, will not be published in open data initiatives. A data provider may choose to publish aggregated or anonymised data. However, even if data is aggregated and anonymised, research shows that it is relatively easy to also link these aggregated and anonymised data to individuals, making them personal data in the context of the EU Privacy Directive. A major issue is then that the European privacy legislation requires that personal data can only be processed for specified, explicit and legitimate purposes and not further processed in a way incompatible with those purposes. However, by definition open data initiatives lack an explicit and specific goal for the data processing. This leads to a simple, but as complex, conclusion: European privacy legislation is a serious barrier for open data initiatives.

8. Future research

Technological developments have always challenged the protection of the right to information privacy. Now that converging and ambient technologies become more ingrained in our society, the question whether existing European data protection law is sufficient to deal with new technological developments has gained more prominence. De Hert speaks of normative and technological discrepancies between practice and data protection law (de Hert 2009). Koops calls data protection laws outdated and unable to protect the citizen's right to privacy (Koops 2011). He raises, but does not answer, the question whether the future of information privacy should be sought outside the realm of privacy and data protection law itself.

This question can also be raised in the context of open data. Is EU privacy regulation still up to date when it creates a barrier to open data policy that seems impossible to break? Ideally, EU data protection law strikes a balance between the right to information privacy and open data that still allows to reap the benefits of open data policy. This issue should be investigated in greater depth.

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