

# GOVERN OBERT 2014

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**Government  
Data  
Openness  
and Re-Use**

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**Martín  
Álvarez Espinar**

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W3C Spain Office-CTIC



Generalitat de Catalunya



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## **Government Data Openness and Re-Use**

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### **Evolution of the Public Authority Model**

Public authorities are institutions that may potentially undergo structural and organisational changes, or even substantive reforms as part of the political strategies promoted by the government of the day. Nevertheless, the internal operations and processes of public bodies, which are often considered archaic and not very productive, do not tend to undergo substantive changes, unlike in the private sector, which is always seeking efficiency and competitiveness, and is constantly evolving to adapt to the needs of society and to improve performances by making the most of technological revolutions.

Just as business models in industry adapt to opportunities in their market, many governments and their public authorities have realised the need to set out and implement changes in administrative policy, in order to improve the performance and operations of departments and staff. Apart from internal processes, many of these public institutions have realised the need to develop strategies for interacting with the citizens to adapt to the requirements of present-day society and make use of technological progress to improve communication with other external actors, such as civil society or other organisations, public or private. To that end, many governments have had to conduct major information campaigns, internal and external, to recast legislation, and to adopt drastic measures that change the orientation of policies in certain areas.

## The Information Revolution in Society

Motivated by the information revolution we are experiencing, all sectors of society are undergoing significant changes, from communication behaviours, to the globalisation of trade or the more efficient administration of the huge amounts of data surrounding us. All that has been possible thanks to information and communication technology (ICT), which is constantly evolving.

ICT has not just affected industry and trade, but even the majority of **the world's public authorities have adopted technology strategies** that facilitate the administration of their internal processes, as well as providing new channels for communication with the public; this is known as 'e-government'.

Processes to modernise authorities have passed through several stages, starting with the implementation of computer systems for storing and processing the huge amount of information they take care of and administer. They have subsequently set up new (one-way) mechanisms for communication with the public, and developed web portals with information that is about the authority itself or is of interest to the various social groups. An important milestone reached in recent years, thanks to technology, has been the establishment of new channels for dialogue between public authorities and other entities, as has been the case with the launch of electronic services for conducting commonplace procedures; one of the most significant and satisfactory is online payment of taxes. Every day, ICT unlocks countless possibilities in governance with the aim of improving society and efficiency in public institutions, which eventually translates to an improved quality of life for the public.

The most significant social revolution is occurring, not in the Western world, but in societies that are less technologically advanced and are far from fulfilling key elements of good governance, such as governmental transparency and democratic participation. One example is remote rural areas in developing countries, the inhabitants of which have been



isolated from those outside their communities and even from their own governments. The growth of mobile communication infrastructure all over the planet and its establishment in less-developed countries make it possible for any group or individual to communicate globally. This breakdown of isolation enables, for the first time, potential communication between large numbers of people and their governments, and *vice versa*.

### **Increasingly Open and Transparent Governments**

With the socio-economic situation as it currently is, there is a mistrust within Spanish society of the government and the political class in general. This is demonstrated by the fact that the Spanish Centre for Sociological Studies (CIS) published research in May 2014<sup>i</sup> showing that **four out of five citizens consider the general political situation in Spain to be bad or very bad**, and that they are not hopeful that this trend will change in the short term. Moreover, according to this study, the Spanish population points to the political class, the political parties and politics in general as the country's third-most serious problem, after unemployment, and corruption and fraud.

The construction of states founded on genuine democracy in which the public trust their leaders would require the way public authorities are run, including all the internal workings of government, to be transparent to their citizens. This concept is nothing new, since the first measures for transparency and accountability were introduced in the Middle Ages: in 1215, King John of England signed the Magna Carta, whereby he accepted, for the first time, the principle of that a committee of barons be consulted and give their assent before new taxes could be levied.

As well as making themselves accountable in this way to interested individuals or groups, governments seeking public involvement in decision making are considered to be following policies termed 'open government', a concept often defined as a synonym of 'freedom of information' and 'access to information'.

This concept, based on transparency, accountability and participation, often finds its way onto the agendas of governments all over the world. It was first mentioned in a 1957 article in *The George Washington Law Review*,<sup>1</sup> entitled *The Open Government Principle: Applying the Right to Know Under the Constitution*.<sup>ii</sup>

The modern concept of open government includes ICT as a mechanism for achieving the objectives set out above. This modern understanding of open government could be directly related to the philosophy of the open source movement,<sup>iii</sup> in which the producers of programmes permit users to access and modify the code of their creations. Lathrop and Ruma support this theory:<sup>iv</sup> “open government now means government where citizens not only have access to information, documents, and proceedings, but can also become participants in a meaningful way”. Both movements share the characteristics of transparency, participation and collaboration.

Nowadays, there are many political programmes that include the concept of open government as the basis for fostering trust in society. **This openness in government is based on the transparency of public policy and the fostering of active and participatory democracy.**

One major milestone in governmental openness was the 2011 establishment of the Open Government Partnership (OGP),<sup>2</sup> in which representatives of eight countries signed an agreement to construct more open, democratic and transparent governments. Over 60 countries all over the world have now signed up to the OGP principles and have openly showed their commitment to civil society and the rest of the world.

The OGP has become one of the most effective mechanisms for promoting open government. All governments of countries with values in line with the principles of the OGP feel the need to take part in this

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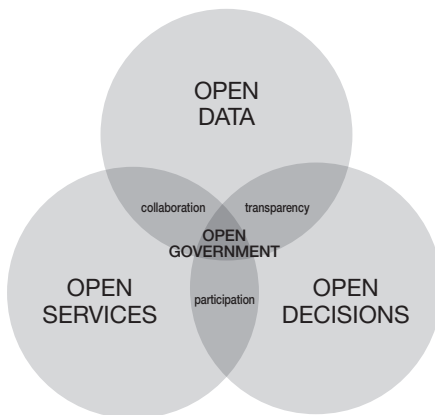
1. <http://www.gwlr.org>

2. <http://www.opengovpartnership.org>

partnership and sign up publicly to this idea, with a commitment to carrying out a series of actions to tackle at least two of the grand challenges set, which include: improving public services, increasing public integrity, more effectively managing public resources, creating safer communities and increasing corporate accountability.

The European Commission, which has also backed the OGP values, aims to encourage inclusion of the open government concept on the digital agendas that define the technological futures of the Member States. With the recent publication of the document *A vision for public services*,<sup>v</sup> the Commission's Public Services unit offers models for implementing the services provided by public authorities, defining the concept of open government as part of a necessary overall strategy that uses ICT as a mechanism for offering and sharing open data and documents to be accessed and used (open data), services available to citizens and companies (open services), and channels for dialogue with the public to improve democracy (open decisions). All that is based on the principles of collaboration, transparency and participation, within a pattern of open government.

**Illustration 1.** *Visual description of the concept of open government*



A very interesting report produced by the National Observatory for Telecommunications and the Information Society – the *Estudio de la demanda y uso de gobierno abierto en España* (Study of the demand for and use of open government in Spain)<sup>vi</sup> – highlights that **significant demand is already emerging in Spanish society for transparency and citizen involvement in public affairs**. It does not specify actions or profiles, but it does indicate that these will be set out gradually as new open government services and initiatives are created. Therefore, this philosophy will become stabilised and will be something that all governments share in the near future.

### **From Transparent Government to Efficient Government**

Present-day society is undergoing significant changes caused by improved administration of information. This unprecedented state of affairs is motivated by the establishment of the Internet and the Web around the world, and remains unexploited.

Through its *eGovernment Action Plan 2011-2015*<sup>vii</sup>, the European Commission makes clear the need for governments to open up and give citizens and companies power within public governance, but it also emphasises the opportunity to **make the most of this information revolution we are experiencing to make society more effective and efficient**, also taking into account that information is very valuable and authorities have information with immense social and economic potential.

The openness of the information of open government initiatives is mainly motivated by the belief that access to information is a fundamental right of the public, and that the information generated and held by public institutions belongs, in the final analysis, to the taxpayer. Based on this premise and on the potential value of public information resources, many governments have wanted to go a step further and seek, not just to involve civil society in public policy, but also to improve the productivity of authorities themselves and offer openly any information considered public, so that anyone can make use of it.

All public authorities administer huge amounts of digital resources and documents that could be of great value if re-used by third parties: geographical information, statistical data, transport information, etc. The uses are multiple and varied; even though there could be direct re-use of an image or a legal text, information is generally easiest to re-use when it is structured and can be processed automatically, in the form of data. The difficulty of processing data sets a significant limit on how they can be re-used, which is the fundamental objective of open data.

There is no set pattern for the potential ways that public sector information can be re-used, since there are many actors that could make use of it. The most obvious are the traditional consumers of information: companies, which conduct market research, and the media, which scrutinise public documentation to find information relevant and attractive to the public (for example, when they publish the results of elections). Another group that requests data is software developers: programmers look at and adapt official data on areas like tourism, transport, security, amongst others, with the objective of creating applications aimed at members of the public or other companies. The potential of re-use is enormous; it is only limited by people's imagination and creativity.

In the same way that companies adapt to the needs of markets, authorities have to evolve. Opening up data can be interpreted as a model promoted by public authorities seeking better and more advanced 'customer' – citizen – service that offers a communication channel in addition to the traditional ones; the ways that have been used to date to find out information (notice boards or, later, web portals) are not the only possibilities.

Many public authorities have changed strategy and started running web portals and dedicating generic services to users (for example, web applications), the specific requirements and functionalities of which have been designed for them; this is done so as to offer an alternative that is much more economical for the body itself and much more flexible for end users, creating new business-development opportunities for companies. Public authorities would have to focus solely on disclosing and

keeping data useful for third parties for developing these services. This would foster innovation and competitiveness, since any company could be entrusted with developing and selling higher-quality services than those that the public authority has provided to date, while meeting all of society's needs; this would have been impossible following the classic approach whereby the public authority keeps the data restrictively, and only makes available the information that it considers appropriate, by whatever means it sees fit.

## **Open Data or Open Public Sector Information**

### **Public Sector Information**

Public sector information (PSI) is understood to mean **information generated or held by public bodies**, at any level of government. It can relate to any sector, can be any sort of information – pictographic documents, statistical data, results of studies of analysis, information on public services, etc. – and can even be subject to licences or copyright that limit access to and public use of it. Furthermore, a large proportion of this information is subject to strict regulation because it constitutes sensitive data, for example data falling under commercial or statistical confidentiality, personal details, or information that affects the defence or security of the state or the public.

There are public bodies that administer information from private organisations, such as the regulators for the fields of banking, competition and markets, communications, and energy. These bodies handle information of great commercial value, although use of these data is very often restricted because they are considered strategic for the companies that report them directly.

### **Open Data or Open PSI**

'Open data' is a term that refers to making information public in an appropriate way, so that it can be **accessed and freely re-used** by

citizens, companies or other bodies. 'Open PSI' is the disclosure of information held or produced by public authorities, via electronic channels based on ICT.

The concepts of 'open data' and 'open PSI' are usually treated as equivalent terms, although 'open data' can also include the data that the private sector makes public, often motivated by the same principles of transparency and efficiency, although the reasons could, in this case, also include corporate social responsibility (CSR).

This concept of 'open PSI' is relatively new, having only been clearly defined in 2007.<sup>viii</sup> Although there are numerous interpretations, they are all based on the principles of this definition, always focused on the end goal, which is the re-use of this information in an effective and efficient way, without obstacles.

One of the pioneers of opening up data to encourage their possible re-use was the United States Government, which made its Global Positioning System (GPS)<sup>x</sup> and the signals with information on geographic location available to its citizens and the entire world over two decades ago. This project demonstrated how shared, open and free resources – subsidised, in this case, by the US taxpayer – enable the development of a business that is often unexpected.

Recently, the eight leading industrial economies that comprise the G8<sup>3</sup> published and endorsed a specific charter on open data (G8 Open Data Charter<sup>3</sup>). In this position paper, the leaders of Canada, Germany, France, Italy, Japan, the United Kingdom, the United States, Russia and the European Union made a unanimous commitment to promote transparency, innovation and accountability through open PSI. The principles set out in this charter summarise the key characteristics of this movement:

**Open Data by Default.** All PSI available to governments and public institutions should be made public by default and re-use of it should

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3. G7 since Russia was expelled, following the Crimea conflict in early 2014

be permitted. This is often made difficult by the administrative policies of the authorities themselves – which are often obsolete – and by legal issues that prevent dissemination in this way. Information considered sensitive by the law of a country or region will be stipulated as an exception, for example personal data, documents subject to intellectual property rights or data that endanger public safety.

**Quality and Quantity.** The re-use of any resource that can be made public has great potential value. To the greatest extent possible, these resources have to be made public in a timely fashion, since the level of usefulness and value of some information is determined by when it is made public (for example, air-quality data, which measure pollution or pollen levels, would be very useful for setting up alerts aimed at people with allergies, but this would only make sense if they were disseminated in real time or – at the very least – daily, since there are many environmental factors that determine the concentration of these substances in the air). Likewise, the data should be very detailed and accurate, and unnecessary processing – aggregation, or any other operation that distorts the raw primary data – should be avoided.

Similarly, as well as offering open data, public bodies should distribute any metadata – information on the resources being disclosed – that describe and classify these datasets in a catalogue with descriptive and technical information that is about disclosure dates or updating frequency, is thematically related, is about authors or licences, etc.

The greater the number and variety of the datasets made public, the more options for making use of them will be available to potential re-users.

**Usable by All.** The information must be accessible to any group to which it may be useful, and there must be no charge for doing so, nor physical, administrative or bureaucratic obstacles. This universal use means that the information made public must be presented in open and standard formats. That means that the distribution channels will



not be subject to usage restrictions, so any user would be able to interpret and use the resources with free or shared-use tools.

**Releasing Data for Improved Governance.** Any governments making efforts to put into practice the good-governance commitment should openly disclose clear information on the standards they use, the policies they implement – related laws and regulations – and their internal processes, and detailed data on the sets of resources made public for possible re-use. In this case, all this technical information will enable an open and exhaustive appraisal of how bodies are run, as well as being very useful for other institutions to take advantage of these policies as a basis for creating their own if they want to follow in the footsteps of those who already have experience of the subject.

**Releasing Data for Innovation.** Apart from the value to society and democracy that open data initiatives have, another of the key areas is economic potential. By default, individuals and companies will be able to make use in this way of the products and services provided on the basis of re-use of this information. It is very important to facilitate this re-use by offering suitable information in a way that can be processed by machines, using the latest and most-advanced technologies to make processing efficient, where possible. The mechanisms by which public information is distributed should follow the most popular standards and protocols in each sector.

As well as appropriate distribution mechanisms, resources must not be subject to licences that limit their use by third parties. All information made public should have usage rights that are unrestricted or have as few restrictions as possible. The majority of these initiatives often use permissive licences that just have specific clauses preventing users from distorting the nature of the data and freeing the disclosing actor from liability, as well as ensuring the traceability of the original data once they have been re-used. Of course, while there are exceptions, public authorities should not levy any sort of charge for using information and, where there is a cost associated with the data, this sum should not exceed what is necessary to cover the additional

costs to the authority of disclosing this information, as per the open data principles.

This vast array of resources, easy to re-use thanks to technology, encourages innovation by creative teams seeking business through solutions for specific problems faced by society. Provided that best practices are followed for disclosure, those re-using data will need to invest minimal effort in processing the information and will therefore be able to focus on innovation.

Another responsibility of any public authorities promoting open data initiatives is the promotion of re-use. This is not just through proactive disclosure of its initiative, but also by encouraging other potential groups of re-users to start developing their products or services through strategies for training companies or by awarding prizes for the innovations of new talents through ideas competitions or programming marathons.

Other organisations or individuals – even government departments or agencies themselves – will also be able to benefit from re-using their own data because, either subdivisions of bodies do not always have a simple way of accessing or processing certain types of information, or no consideration has been given to how to access it. In that case, although there is no associated commercial objective, it would represent a saving in direct costs for the public authority itself.

## **Open Data for Tax Transparency**

As well as endorsing the principles for the disclosure of open data, the G8 leaders signed the Lough Erne Declaration,<sup>xi</sup> an agreement that sets out the areas that will be tackled to achieve a more transparent international economy, and that demonstrates the commitment of the world's great powers to changing to a financial system that prevents common practices relating to tax evasion and to the black economy.

This declaration is focused primarily on resolving the problem of the accountability of the private entities that, in the end, take the lead in economic growth, reducing poverty and boosting employment; it includes several items relating to open data:

- Tax authorities across the world should automatically share any information that enables the combating of tax evasion.
- Companies should know who really owns and has invested in them; in the same way, tax collectors and law enforcers should be able to obtain this information easily.
- Extractive companies should report payments to all governments and governments should openly disclose income from such companies.
- Land transactions should be transparent, respecting the property rights of local communities.
- Public authorities should disclose information on laws, budgets, spending, national statistics, elections and government contracts in a way that is easy for citizens to read and re-use.

Although the information mentioned in these items is not always produced by public authorities, governments have an obligation to influence private companies by implementing any policies and mechanisms that impose transparency on companies' accounts and administration.

## **PSI Re-Use**

As mentioned above, PSI re-use is the consequence and end goal of open data, whereby any individual or organisation can make use of the PSI disclosed by public authorities for any purpose, even for profit.

## **Re-User Groups**

There is a traditional sector whose principal activity is based on data re-use, sometimes referred to as the 'infomediary' sector. It comprises companies dedicated to compiling, processing and analysing information from various public and private sources, to create value-added products aimed at third-party companies or at the general public. These

companies have tended to belong to specific sectors, although they are not exclusively limited to these, and are completely focused on – or, at least, include a specific division or department dedicated to – marketing PSI-based products or services. These traditional fields re-use geographic, commercial or economic data, socio-demographic statistics, or legal information.

Re-use is not limited to private companies, since any group is a potential user of PSI. Even **members of the public** are direct re-users who, while not necessarily aiming to make a profit from this re-use, take advantage of this alternative source of information to meet their needs, or simply out of curiosity.

Civil society and, more specifically, **civic activists** tend to use PSI to monitor public governance; this work enables them to combat corruption and abuses of power, and to help improve the performance of governments and related public authorities.

**Researchers and academics** also play an important role in re-use, since one of the key elements is innovation in the creation of new solutions or ideas based on technology. The information held by public institutions is a high-quality primary source for research. In fact, scientists have always been great experts in data processing.

Another, even more obvious, group of re-users is the **public sector itself**. Bodies with common goals can share information on their administration – strategies, regulation, internal processes – to make the most of the satisfactory work carried out by equivalent bodies in other countries, regions or cities. Units or departments of the very public body that is opening up its data can, in turn, be re-users of their own information. The open data initiative is an opportunity for focusing original and high-quality data on a common idea. These data can be very useful, since departments do not always communicate with one another, and staff do not always have the same level of access to an organisation's central computer system or the system distributed throughout the organisation.

## The Re-Use Market

There have been several attempts to classify the real value of open data initiatives and the impact of re-using such data. The majority of studies are based solely on the economic impact on the 'infomediary' industry.

At the end of 2013, the Multi-Sector Information Association (ASEDIE) published its report on the infomediary sector in Spain,<sup>xii</sup> which identified 444 companies of various kinds in Spain, although the majority of the companies analysed produce market research and opinion polls, but with the shared feature that they operate in fields related to data re-use. This study estimates that, taken together, the aforementioned companies have around 10,000 employees and generate an annual turnover of some EUR 900 million.

To a certain extent, this attempt to quantify the business of this sector alone is incomplete because, in this way, only the profits made by these companies is taken into account, without considering the pos-

**Illustration 2.** *Reproduction of the Elogio del Horizonte (Gijón, Spain) in the game Minecraft*



sible collateral effects on other bodies or individuals, or the impact that this business will have on public authorities in the form of taxes or improvements to their public services.

The business models and possibilities offered by re-use are very diverse, although the following stand out:

- **Development of applications and products for end users.** This is the simplest example, whereby a company or individual uses PSI to develop a computing-related product (for example, web applications), which will be available for consumption by the general public. This category includes the development of games based on real data about the population, the land and the environment. Examples include projects to represent maps of regions and countries in the popular game Minecraft,<sup>4</sup> developed for Denmark,<sup>xiii</sup> the United Kingdom<sup>xiv</sup> and Gijón<sup>xv</sup> (Spain).
- **Development of intermediary products for re-users.** Although perhaps not as obvious, there are companies dedicated to developing applications for processing public data, for example manufacturers of geographic information systems (GIS), or bookshops that automate and simplify attractive visualisations of information using infographics.
- **Data journalism** is a discipline that has become part of the mainstream media, with the aim of offering easy-to-understand and intuitive representations of information. Data journalists use techniques based on processing data and producing visual representations of them to make their work more efficient.
- **Socio-economic statistical studies.** Many traditional companies operate mainly in preparing market or social research for other companies or public authorities. These studies are used for the purposes of analysing markets and evaluating commercial, marketing and sales risk.
- **Works of art** based on PSI for subsequent sale or exhibition. There are cases of artists who create PSI-based multimedia project and represent the information in an innovative, disruptive and attractive way.

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4. <https://minecraft.net>

## Return on Investment from an Open Data Initiative

Determining the actual profit from an open data initiative is a common question posed by all organisations designing open data projects. Obtaining an accurate measurement of the value generated by open data for public authorities themselves is a very complex task because, with some exceptions, there does not tend to be a direct profit in these cases that could be used to measure the positive economic impact it has on the authority.

One variable that can be quantified is the performance of the organisation itself in making the administration of its own internal procedures more efficient, or in improving interoperability between the units responsible to it or with other bodies at various levels. This increased efficiency can only be evaluated accurately in specific cases, in which there have been changes in the authority's processes in pursuit of certain objectives for which specific resources are being invested. To achieve that, it would be necessary to quantify, before and after implementing the open data project, the variables related to these processes: time invested to achieve the objective, dedicated human resources and direct costs associated (material, equipment, etc.).

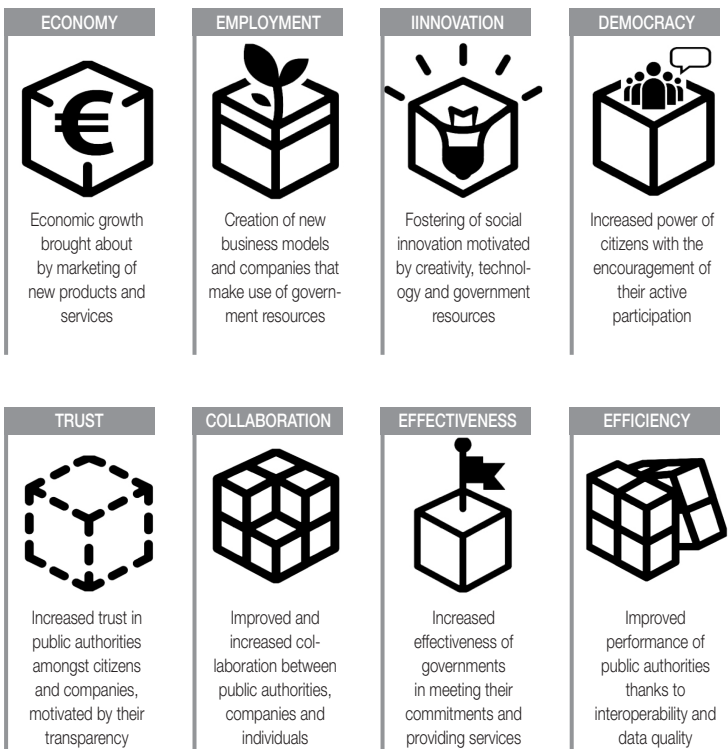
An additional problem is that, in the majority of new open data initiatives, it is not possible to obtain information on this return in improved efficiency of governance because no comparison can be made with services or processes prior to these actions; they are innovative services and cannot be compared with others that already existed. In these cases, public authorities could measure qualitative return in the form of the social impact of providing the new services based on open data and their re-use. To measure the growth of social value over time, we need to create citizen satisfaction surveys.

## Benefits of Open PSI and its Re-Use

### *Economic Growth*

As mentioned above, open data are hard to quantify in economic terms, although there are studies conducted years ago that show figures related to open data re-use. One example is the case of the Global Positioning System (GPS) information made available by the US Government, which started to be used *en masse* in the 1980s. It is currently estimated that over 7% of European GDP – some EUR 800 billion – depends on this type of information and that there is an annual market for services and products based on global satellite

Illustration 3. *Benefits of PSI Re-Use*





navigation estimated at some EUR 124 billion; this figure is expected to double by 2020.<sup>xvi</sup>

Although we are at the initial stage and the potential of open data re-use still has not been fully exploited, there are now other attempts to estimate this value. In 2011, the European Commission published a report<sup>xvii</sup> that studied the economic impact of re-use that is free or has a marginal cost in EU Member States. It concluded that the direct impact is around **EUR 40 billion** per year, with the indirect impact as high as **EUR 140 billion**. The gains for government from selling PSI are pretty negligible, at only 1% of the latter figure: EUR 1.4 billion per year.

Open PSI and its subsequent re-use paves the way for potential business in various sectors and groups. Entrepreneurial companies have the possibility of offering alternative services and competing with big companies. For example, thanks to the opening up of high-quality datasets and the existence of open-source and free map platforms, such as OpenStreetMap,<sup>5</sup> small companies developing web applications can compete with the major corporations that have come to dominate the GPS navigation market.

Of course, the economic growth of these companies has a direct impact on the public authorities in the country or region where they are registered, since they will pay the taxes corresponding to the exercise of their commercial activities.

### *Increased Employment*

The ASEDIE report on the infomediary sector in Spain identifies some **444 companies** in Spain with activities relating to use of PSI, **directly employing 9,971 people** in 2011.

The creation of new businesses increases employability and lowers the unemployment rate. This does not just impact on social well-being, but

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5. <http://www.openstreetmap.org>

also affects government revenue because taxes and social security payments are made. There are numerous examples of very successful and popular companies being created.

### *Innovation*

Likewise, individuals and companies with innovative and disruptive ideas, suited to the needs of modern society and taking advantage of the flexibility ICT offers for conducting business at global level, promote **revolutionary commercial initiatives**, which could even change the traditional rules of the sectors in which they operate. These organisations with big ideas do not need to invest heavily to obtain high-value official information about the public that can be accessed and processed automatically. One example that illustrates this type of successful new business model based on creativity and innovation is data brokers, organisations that create websites that gather raw data from open data portals, process them – adding information, putting the physical resources in place, and carrying out aggregation or calculations – and, like any other trader selling digital products, make the enriched data available in formats better suited for other potential re-users that lack adequate means or know-how to process them.

True economic potential is often achieved by making use of PSI combined with data from private companies to support new products or services. One success story is iTriage<sup>6</sup>, an application developed by a US company founded by two accident and emergency doctors, which aggregates healthcare data, (public) information on the products of insurance companies and a public directory of clinical establishments. Its users can find out which clinic is best-suited to their health problems, on the basis of the symptoms they are displaying and their physical location at that time.

Traditionally, public authorities close to the citizens have tried to provide their users with all types of service, often in the form of web applications

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6. <https://www.itriagehealth.com>

or services. The development of applications to cover these supposed needs – they are often not things that society actually demands – is very expensive. There is a change of mentality in many of these public authorities, which are offering developers – individuals or companies – the chance to create applications to provide public services, even if it is financially remunerated. It is always necessary to start from the idea that specialist companies and experts know how to identify the needs of citizens and create very attractive services.

Promoting such innovation is important and features heavily on digital agendas, above all the Digital Agenda for Europe itself.<sup>7</sup> At the same time as it encourages the disclosure of public resources to companies and individuals, the presence of elements and actions that foster entrepreneurship will enable European society to make use, in a smart and advanced way, of resources that are public by definition.

### *Democracy and Citizen Empowerment*

Normally, a high percentage of the population only interact with public authorities through the most traditional channels: administrative procedures over the telephone or face-to-face. Although the majority do not consider improved interaction with government necessary, thanks to open data, a new channel is available for constructing suitable services for citizens and for bringing the two closer together. This would **empower civil society**, which would become able to access information and services using other means with which it is more comfortable, such as applications integrated into social media, or dialogue with the public authorities based on alternative mechanisms (for example, web applications that enable reporting of road-traffic accidents), amongst others.

Thanks to these new actions, a higher percentage of the population will be able to take part in public policy, influence it and improve governance of their country or region, thanks to participation that is more democratic.

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7. <http://ec.europa.eu/digital-agenda/>

### *Trust in Government*

There is a type of information relating to the internal workings of public authorities that enables evaluation of how institutions are run and the work of governments: budgets and accounts, strategic planning, level of compliance with plans, public procurement, regulation, and other information about institutional administration. **Transparency breeds trust.**

This form of open data gives the public and markets confidence because it makes external monitoring and evaluation possible, which results in continuous and widely distributed oversight and auditing; any group or individual would be able to check the government's actual performance and evaluate its actions.

Apart from information strictly speaking related to administering the workings of public authorities, many governments publish open data on staff: the salaries and holdings of senior officials, and compatibility reports on civil servants.

These documents and the aforementioned information, as well as being a government measure to foster transparency and accountability, are also considered to come under the heading of data that can be re-used, as part of the open data model, for purposes beyond purely those of transparency. However, a more common method of re-use, to which we are accustomed, is the publication of press articles on the salaries and holdings of senior officials, and information on the status of public projects put out to tender and possible discrepancies in the budget.

One mistake made by many public authorities in the desire to be transparent is the disclosure of raw data *en masse* because, paradoxically, **mass transparency reduces transparency.** The large volume of data and the specialised terminology often mean that such transparency has the opposite effect, with only specialists in the field able to interpret the information. Therefore, the content must be adapted and 'translated', so that anyone can understand it. Otherwise, instead of increased

transparency, 'data drunkenness' will result in reduced transparency because of nomenclature and vocabulary that are too technical.

Full transparency is achieved when all information can be accessed and understood by anyone; this requires, not only opening up data in formats that can be processed, but also offering alternative representations, such as intuitive ways of displaying it.

### *Collaboration*

Open data, as an additional communication channel from public authorities to any institution or individual, does not just foster the participation of third-party bodies, but also offers countless **opportunities for collaboration** between the various parties.

There are cases in which governments receive aid from external organisations to improve their governance and administration. One case that illustrates this took place in 2007, when a financial analysis – not by the government – based on open data uncovered one of the most serious tax frauds in the history of Canada,<sup>xviii</sup> which enabled the country's government to recover CAD 3.2 billion (some EUR 2.2 billion).

### *Effectiveness of Government*

Ideas of open data and their re-use are evolving and set to become a fundamental right of society. Public authorities are adapting themselves to make this new model a key element of such organisations. Once this has been achieved, society itself will benefit greatly, and public authorities will be more effective, conducting the tasks entrusted to them much more efficiently.

Information available to everyone could be audited by interested groups and processed by experts in the field. This help from the public, boosted by the network multiplier effect, will serve to **uncover cases of fraud and corruption**, as mentioned above; to **improve the quality of information**, by showing up inconsistencies or errors in the data; and

to **bring the public closer** to the concept of true democracy, making them participants in public processes and activities.

### *Efficiency of Government*

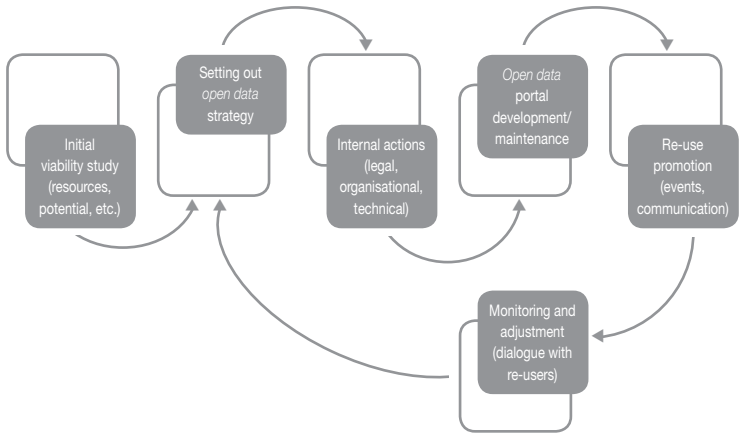
Traditionally, one of the biggest problems with large organisations, both public and private, has been handling information shared between systems scattered across different departments. Although, in the majority of cases, these departments have the same sort of information, they do not always use the same models or formats for representing it, or the systems are not compatible with each other.

In its 25-year existence, the web has demonstrated that **the solution for exchanging information involves using open and standardised protocols, formats and vocabularies**. Therefore, any authorities that use internationally agreed formats and mechanisms will make it simpler for third parties to exchange information; in other words, interoperability will increase.

An illustrative example of this efficient functioning related to economic impact is the case of an agreement signed in 2002 by the Danish Government, whereby it committed to official data about the country's roads and streets being opened up and made available free of charge, which enabled them to be used with no conditions attached. A study analysing the direct economic impact of this plan in 2005-2009<sup>xix</sup> determined that the government had invested some EUR 2 million in meeting this commitment to open up and maintain this information, which had a direct economic impact of EUR 62 million during that period. The return on the investment in this case is obvious: greater economy for industry with a direct economic return and innovation in the creation of new, high-quality services, as well as improved social well-being thanks to those services.

## **The Lifecycle of Open Data and Re-Use**

Each organisation needs to adapt its open data strategies to its internal policies, although there are some common sequential steps that should be followed to achieve a successful initiative.

Illustration 4. *Lifecycle of an open data initiative*

As a first step, the body should conduct an **initial viability study**, analysing the extent of its commitment, the material and human resources it has available to run the initiative, current legislation, the actual political involvement within the organisation and external demand.

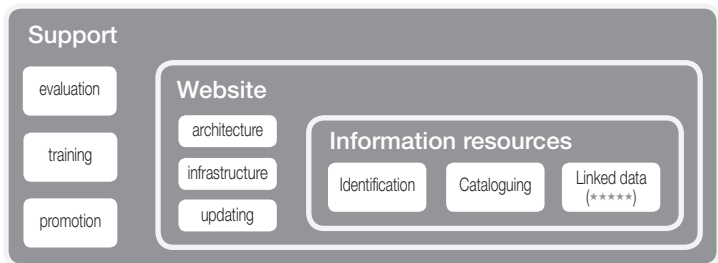
### Open Data and Re-Use Strategy

Following the initial study, the body will set out an overall strategy,<sup>xx</sup> which will focus on three extremely interrelated aspects, on which the various activities that are to be planned will be based:

- **Information resources.** Government data and documents are the raw materials that are the subject of the open data strategy. This strategy will be followed when carrying out activities aimed at the body recognising these data, analysing the viability of their re-use by third parties and improving them where possible.
- **Website.** This is the main medium whereby bodies disclose information resources, and the actors re-using these resources locate and benefit from them. This is where activities aimed at improving information on the data presented, at their availability and security, and at the data themselves are carried out; it also houses updating tools and mechanisms for locating, filtering and accessing the data.

- **Support.** It is the support element that contains actions for overseeing and monitoring open PSI and re-use activities. It also includes training actions for the people involved, as well as activities to increase knowledge of the subject and, in particular, of the resources and tools for the re-use of data disclosed by the body.

**Illustration 5.** *Elements that need to be included in an open data strategy*



The strategy should, at the least, follow these steps:

- **Identification** and selection of potentially re-usable information, on the basis of the data the organisation already makes available. Initially, any that can be downloaded directly from web portals will be chosen.
- Design of a procedure for **preparing and generating** datasets and documents in the best-possible format – even considering a ‘linked data’ model – and taking into account technical or legal limitations (ruling out information affected by intellectual property rights and security issues, and personal data), while improving their quality and prioritising the datasets requested by the re-using actors.
- Establishment of the **re-use conditions** applicable within the legal framework affecting the public body.
- Creation of a **specific website**, which will include information about the project, legal information, elements of communication with third parties and an inventory with access to the available data.
- **Disclosure and maintenance of data and documents**, which will be catalogues and accessible from the website. The catalogue of these resources will have to contain updated metadata – structured



information that describes, explains and locates an information resource<sup>xxi</sup> – to make it easier to discover and use. It is also important to inform the public clearly about the re-use conditions applicable to the datasets and documents.

- **Setting out of a strategy for communication and training** that enables the basis and objectives of the project to be made public, attempting to involve other groups in that movement.
- **Setting out of a strategy for evaluation and improvement** of the quality of the initiative, in which some quantifiable targets are estimated on the basis of specific indicators (access to datasets, actions taken, etc.).

### *What Type of Information Needs to Be Made Public?*

Any information not subject to the legal limitations set out above (security, personal data, etc.) can be included in an open data catalogue, from a database of any sort, to the digitised artworks of a gallery.

Since making all the information that meets these requirements could be an arduous task for any of them, bodies should set priorities and create a disclosure strategy. Although there is no standard list of subjects that are more important than others, since the purpose of re-use is not known in the majority of cases, two core criteria should be prioritised:

- present demand from re-users (existing and potential)
- documents and data that could be disclosed immediately or at low cost

It is important that the body promoting the open data initiative know, within its areas of activity, the re-user collectives and the needs of the community. This will enable it to **prioritise the information most useful** for those who will actually use the data.

Although trying to categorise information is complicated, there are some sectors that have traditionally requested more PSI and can, therefore, be considered areas of great interest, since re-use of such data will constitute a pull effect for other individuals or bodies that do not know about the possibilities offered by such initiatives.

It may be that disclosing the requested data is extremely expensive for the public authority itself. In that case, it would be possible to establish agreements with private bodies that could contribute to the work of disclosing the information. This can often result in agreements regarding the exclusive use of the information, which would breach the principle of unconditionally open data. A clear example of that can be seen the field of culture, in which libraries, art galleries and archives reach agreements with companies digitising their literature, paintings or historical texts to make them subsequently available to a public authority; in some cases, these companies are remunerated for their work by the exclusive use of the digitised works, albeit for a limited period.

Various studies have attempted to identify datasets considered high value. For reference, the G8 Open Data Charter compiles and indicates the following fields as important priorities:

High-value areas of information	Examples
information about companies	business register
crime and justice	crime statistics
Earth observation	weather observations and forecasts
education	lists of schools and school performance indexes
energy and environment	air pollution levels
public procurement	tenderer profiles, tender processes
financial data	budgets and spending
geospatial information	maps
global development	international aid, food security
democracy and accountability	information on government representatives
health	prescription data and pharmaceutical spending
science and research	genome data, experiment results
statistics	socio-demographic statistics
social well-being	Social Security and housing statistics
transport and infrastructure	public transport timetables broadband penetration

The datasets associated with these areas are not always the most-requested, but each body has specific resources that affect its community of re-users and could be very useful. One example of how

simple this can be is the success story of disclosing a trivial piece of information that does not include sensitive data and is much-requested in several of Spain's autonomous communities: Bank Holiday calendar. Other examples that are very useful and have great potential throughout Europe are the databases with the translation memories of the European Commission's official translation service, and the official thesaurus EUROVOC,<sup>8</sup> which details terms and concepts handled by government at EU level in many languages.

Each body needs to be aware of who the potential re-users of its resources are, and should use its own know-how to identify the high-value datasets. For example, the European Commission, using sector-based prioritisation, has identified<sup>xxii</sup> and classified the following datasets, considered high value by their re-user community: budget of the EU institutions, data on elections to the European Parliament, Eurostat statistics,<sup>9</sup> records of the Commission's expert groups, Commission staff, contracts and beneficiaries of EU expenses, information on the implementation of EU-funded projects, global development aid, register of polluting companies and air quality.

### *Appropriate Disclosure Formats*

Apart from information type, there is also a need to mention its format and the mechanism by which it will be used. 'Format' can be defined as the characteristics and specifications for presenting the information electronically and in a way for which the processing can be automated. The format normally relates to the type of file in which the information is presented, for example XML or HTML; this structures and defines how it is stored. In addition, this concept also tends to include the mechanism or protocol for accessing the data; this means the web services and the application programming interfaces (APIs) that make the information available in various end formats, such as SOAP, WFS or WMS.

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8. <http://eurovoc.europa.eu>

9. <http://epp.eurostat.ec.europa.eu>

Although re-use is not dependent on selection of an appropriate format, it will facilitate the process for re-users; doing otherwise could make it extremely difficult to access or process information.

To guarantee the principle of universal accessibility and non-discrimination against users, the **use of open formats** is recommended, meaning formats that are clearly specified and freely accessible. Wherever possible, standard open formats will be selected rather than proprietary ones, meaning shared-usage ones that are not restricted by associated trademarks or patents. Normally, open formats are those that can be accessed and processed using tools available to any user.

As with information, the government body should find out the formats most-requested by re-user groups. For example, in the GIS sector, although there are various different specifications and means of distribution, administrators of these systems and potential re-users are accustomed to using files in 'shapefile'<sup>xxiii</sup> (.shp) format, a specification of the Environmental Systems Research Institute (ESRI). Although this format for describing geographical features is non-standard, there are numerous processing and conversion tools, so information handlers can offer the datasets in this way, which is widely used and accepted by the community.

There is no definitive common format in which to make information public, although it must always allow **automated processing**. Each information type can be presented in its own ways and experts in each field know how to recognise them easily. The general rule is to disclose the data in the format in which they are originally available, although they should ideally be disclosed in standard or widely used open formats, in strict compliance with open data principles.

Where the data are difficult to obtain or converting the documents is too expensive for the public authority, it can try to establish agreements with groups interested in re-using its specific information, whereby both work together to achieve the goal of making the dataset public in the appropriate format.

### *Re-Use Conditions*

As a general rule, open datasets will have **permissive re-use conditions that do not restrict access to or use of them**, or the creation of services and products based partially or wholly on them, for commercial purposes or otherwise, so as **not to limit competition**.

Normally, open data portals tend to set terms of use that set out some general conditions for re-use of the resources displayed. These rules often authorise re-use, including the processing of information – combination of the data with other resources, modification of the information, copying, re-organisation – and its subsequent dissemination by any means. The conditions of use ensure free, non-exclusive transfer of the intellectual property rights of any resources that they cover.

The European Commission has published guidelines to help governments to set basic and appropriate conditions for re-use,<sup>xxiv</sup> which prevent, for example, misrepresentation of the original meaning of the information, and distortion of the data to express any messages that contradict its original nature. In the same way, where references to the re-used resource (its metadata) are shown, the original data will not be misquoted to prevent confusion about the origin of the original data. It is also recommended to keep a link to the original source; this can be done by mentioning the original source of the data and including a reference to the original dataset, preferably a URL (web address); it should also be indicated when the resources were taken for re-use, meaning the date the data within an application or service were last updated.

For resources in the public domain, a simple notification is recommended – for example the Creative Commons (CC) public domain mark<sup>10</sup> – that clearly indicates the legal situation for these data or documents. For resources with specific conditions, the use of standard open licences is recommended – for example, the aforementioned CC

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10. <http://creativecommons.org/publicdomain/mark/1.0/>

licences<sup>11</sup> – to prevent the creation and updating of specific licences at national or regional level.

Even when access to data needs to be free of charge, public institutions have the authority to permit data re-use with a commercial agreement. This could be, at the most, what is known as **marginal reproduction cost**, meaning the additional sum of money that it would cost this body to make this information available following open data principles. If the body chooses this pricing system instead of making the information available at zero cost, it must be completely transparent with its calculations.

A recent study<sup>xxv</sup> ordered by the European Commission on business models relating to the PSI sector indicates that bodies that changed from charging for data to offering them for free (or at marginal cost) experienced up to 10% growth in re-user numbers, particularly small and medium-sized enterprises. Once the internal procedures for disclosing the information have been created, these new activities become routine for the organisation, so the cost tends to disappear. It should be remembered that a price schedule based on zero cost simplifies transaction processes, which affects administrative tasks like invoicing, and other costs such as checking applications and compliance with re-use licences, so it can be concluded that it is more appropriate to follow the free schedule the majority of the time.

### Internal Actions

Once the first version of the strategy has been set out, the body has to adapt its procedures and protocols to adopt the structural, organisational, technical and legal measures planned for the short and long term in the strategy document.

These actions will include, *inter alia*: in-house training of staff involved in the project and appointing people or creating bodies with powers

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11. <http://creativecommons.org/licenses/>

as regards handling and releasing PSI, and even changes in policy on the handling and disclosure of this information.

### **Development and Maintenance of the Open Data Portal**

This stage includes, not only creation of a website housing information on the initiative, but the entire process of disclosing data and documents, from their identification in the body's internal systems to making them public in an online catalogue.

### **Re-Use Process**

Promotion of the open data initiative is important, both to public institutions that need to be made aware of this model – often new and disruptive for their staff – and to possible re-users who may not even know that is what they are.

Promotion takes place through talks or training actions aimed at the organisation's internal staff, at which the strategy that has been designed and its impact on the various units are set out. As well as these internal awareness and training programmes, there is a need to run information activities (general or technical events, courses, or media promotion) aimed at re-user groups, with the aim of promoting the participation of companies or individuals in the project.

### **Monitoring and Adjustment**

Once the open data strategy has been put in place, and perhaps the first cases of re-use noticed, there is a need to evaluate how well the initiative is working, analysing any problems detected, as well as the use made of disclosed data, the groups participating in the project and the improvements received.

This analysis would have to be periodic and could impact on key aspects of the strategy, so it could need to be modified to

adapt to the adjustments promoted by the body itself and the needs of society.

## **The Legal Framework in Force**

### **European PSI Re-Use Directive**

In November 2003, the European Parliament and Council adopted a Directive tabled by the European Commission on the re-use of PSI: Directive 2003/98/EC.<sup>xxvi</sup> One of its main goals is to establish a competitive European market for making use of PSI, with a common framework of regulation and actions for all 28 Member States. A decade later, following a public consultation, this Directive was amended, to make some items more specific and update the content to involve more sectors, and it was published as Directive 2013/37/EU<sup>xxvii</sup> in June 2013. This situation ensures that European companies will make the most of potential economic growth and job promotion appropriately.

This Directive does not make it mandatory to disclose public-sector digital resources or permit their use, since that would depend on the bodies themselves, which are answerable to the Member States, but it does urge all these bodies to disclose information that is allowed to be made public, provided that there are no limitations imposed by legal issues or specific access schemes.

An important aspect of this Directive is that, while it leaves the door open to bodies being able to establish given costs for accessing and using resources, these prices cannot, under any circumstances, exceed the marginal costs of reproducing the documents to be disclosed and making them public.

This Directive lays down the bases for opening up and re-using PSI, even calling on any bodies that participate in these initiatives to list open resources in web-based catalogues, clearly identifying and displaying the relevant licences or conditions of use, where applicable. It also



urges the Member States to respect market competition regulations, in an attempt to prevent the creation of exclusive agreements, which limit access by certain individuals or organisations.

### **Act and Royal Decree on PSI Re-Use in Spain**

In order to transpose Directive 2003/98/EC, the Spanish Government passed Law 37/2007 on the re-use of public sector information<sup>xxviii</sup> in 2007. It regulates the re-use of documents drawn up or kept by the public-sector bodies of Spain's central government. This specific Act does not modify the system for accessing government documents and resources already provided for in the Spanish legal system, but improves the right of access and establishes a basic framework of legislation for making use of information held by the public sector.

The purpose of this Act is to encourage the disclosure and re-use of PSI resources, facilitating the development of products and services based on those resources, increasing the effectiveness and efficiency of how they are put to use, and benefitting from them.

In 2011, the Ministry of Industry, Tourism and Trade<sup>12</sup> and the Ministry of Territorial Policy and Public Authorities<sup>13</sup> produced Royal Decree 1495/2011,<sup>xxix</sup> which aimed to specify the provisions of the aforementioned Law 37/2007 applicable at central-government level, meaning those answerable to the Central Government Administration (AGE). This promoted making PSI available for re-use and made re-using it as easy as possible.

To this end, on the basis of the general framework laid down in Law 37/2007, and the need to develop legislation, Royal Decree 1495/2011 regulates the following areas:

- It authorises the re-use of public-sector documents, provided that access to them is not restricted by existing information-access legislation.

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12. Now the Ministry of Industry, Energy and Tourism.

13. Now the Ministry of Finance and Public Authorities.

- It makes it mandatory to list the body's re-usable information resources online and to include them in the central government's PSI catalogue, located on the [datos.gob.es](http://datos.gob.es) portal.
- All public-sector bodies affected by the royal decree have to draw up an open data strategy, which must designate heads of each unit to carry out the tasks relating to the coordination of re-use activities, establishing a set of minimum functions that will be coordinated from the central government.

As well as regulating the functions and obligations of bodies answerable to the Central Government Administration (AGE), the royal decree lays down the conditions for making information available through the PSI catalogue via a legal notice model that covers all the general re-use conditions. This legal notice, which is open in nature, that which will be imposed by default on all the datasets and documents listed in the open data catalogue, while enabling bodies to set out specific conditions whenever they consider it necessary. Where these specific conditions are applied to given results these will, with some exceptions, be submitted through standard licences, preferably ones that are recognised and used internationally, for example the aforementioned Creative Commons licences.

It must be stressed that no existing legislation sets out the system of financial charges that can be levied in exceptional cases. That is up to the judgment of the very bodies bound by the specific associated regulatory frameworks.

### **Spanish Transparency, Access to Information and Good Governance Act**

Of the national legislation on open data, Law 19/2013 on transparency, access to information and good governance<sup>xxx</sup> is particularly important. It is an Act passed with the intention of **increasing and enhancing transparency in public activity**, which is articulated through proactive disclosure obligations for public authorities and bodies; it recognises and guarantees access to information, regulated as a right that is wide-

ranging in scope and subject matter, laying down good governance obligations with which senior public officials must comply; this makes good governance a responsibility that must be observed by all those involved in activities of public importance.

This Act obliges public bodies periodically to disclose and update significant information, in order to ensure the transparency of their activity, relating to the workings and monitoring of public actions. It also specifies a minimum number of datasets that have to be made public, including: legal, economic, budgetary and statistical information from units, as well as updates on bodies' structures, with specific information about their senior officials.

Apart from these basic data, which public bodies have to disclose proactively, any interested party can make use of their right to request specific information, without even having to explain the need for or purpose of this request. As a general rule, the applicant must be notified of the resolution in which access is granted or refused within a maximum of one month, but **this Act permits the application of what is known as the 'negative silence procedure'**. This means that, if no express resolution has been pronounced and issued by the deadline, the application is to be considered refused.

The proposal of the negative silence procedure is one of this Act's weaknesses, which has been condemned by the main groups struggling to protect the right of access to information. Access Info Europe<sup>xxxi</sup> criticises this proposal because it breaches one of the basic principles of the right of access to information, since reasons for refusal should always be given. This not-for-profit organisation observes that half of the information requests received by the Spanish Government result in the silence procedure, so choosing this method will be a major obstacle to implementing a good transparency system. Access Info Europe also recognises the entitlement to access information as a fundamental right; it is already recognised as such by over 90 laws the world over, but not by this Transparency Act.

It is not just these groups of activists that have criticised Spain's transparency legislation, but even the European Commission, in its report on corruption in Spain.<sup>xxxii</sup> The Commission considers the steps taken insufficient, particularly in view of the lack of an independent monitoring mechanism: while the Act covers the creation of the Transparency and Good Government Committee (CTBG), it will be chaired by an appointee of the government itself.

In Catalonia, the Parliament is working on the future Catalan Transparency, Access to Information and Good Governance Act. In broad terms, the current wording provides for shared and unified access to the public procurement and subsidies of, not just the Catalan Government, but also of all Catalan public authorities – including state-owned universities – and companies that receive subsidies from the Catalan Government. It also provides for creating a register of lobbyists, which must also be accessible from the transparency portal. Its most remarkable features also include that it should link to the current services charters of Catalan Government bodies and the related service appraisals. The most noteworthy way in which it differs from the text of the Central Government's Act is that it establishes the principle of the positive silence procedure.

### **National Interoperability Model and NTIs on PSI Re-Use**

The National Interoperability Model (ENI) is defined in Law 11/2007, of 22 June, on electronic access to public services for citizens, as "...the set of criteria and recommendations in relation to the security, keeping and standardisation of information; to formats; and to the applications that public authorities shall take into account when taking technological decisions that ensure interoperability".

Royal Decree 4/2010, of 8 January, regulating the National Interoperability Model in relation to e-government, establishes the development of a dozen technical interoperability standards (NTIs), drafted to cover needs derived from the applicable legislation, in a starting approach based on minimums, to ensure interoperability between the various

public authorities. Therefore, its implementation and application in the short term with minimal impact is encouraged, but without losing the intention to develop and improve over time, at the same time as progress with e-government services, support infrastructure and technological development.

Basically, these NTIs set the technological standards for public authorities in Spain, describing policies and protocols, as well as the formats and technologies to use for developing e-government in Spain. Examples of these technical standards include the catalogue of standards, electronic documents, electronic records, the authority's digital signatures and certificate policy, and data intermediation protocols.

In particular, NTIs relating to PSI resource re-use set out concepts relating to the development of policies for public authorities' management of information resources, including issues relating to their practical implementation, and identification of the requirements and processes for managing PSI.

These NTIs are based on the aforementioned foundations of open data and re-use, and they set out a series of guidelines for public authorities to develop their own policies for re-using documents and information resources. The document details the requirements for implementing a methodology for the disclosure of re-usable information, from identifying, selecting and describing it, to choosing suitable formats and indicating how to apply appropriate terms of use. Likewise, it sets out the guidelines for producing a re-useable PSI catalogue to be published online, following the international standards of the World Wide Web Consortium (W3C<sup>14</sup>) and those established by the European Commission's Interoperability Solutions for European Public Administrations group (ISA).<sup>15</sup>

This national standard serves as a benchmark for public bodies in the implementation of open data strategies, and offers the technological basis for extended use, to ensure full interoperability amongst open

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14. <http://www.w3.org>

15. <http://ec.europa.eu/isa/>

data initiatives. This will enable processing that is homogeneous and harmonised across all public authorities, with multiple applications such as the aggregation of open data catalogues for all Spanish initiatives at a central point, and their subsequent compilation at EU level in the future pan-European open data portal.

## Types of Open Data Initiative

As we have already seen, open data is a relatively simple philosophy that any public authority could set up without much work. Apart from a strategy that sets out the role of the authority and its senior officials, as well as the disclosure strategy (types of data to be made public), a web portal needs to be developed, which can inform about the project, the conditions for using the data and the data themselves, listed as an inventory.

### Tim Berners-Lee's 5-Stars Rating

There is a classification<sup>xxxiii</sup> developed by Tim Berners-Lee, inventor of the Web and Director of the W3C, which enables quantification of the technological quality of open data using a stars-based classification, with scores from one to five, depending on the format used to represent the data.

This system of symbols is incremental (each score includes the features of the previous one) and covers the following circumstances:

#### ★ *One star*

- Data or documents available on the web in any format.
- With an open, unrestricted licence.
- Unstructured format.
- The dataset or document can be viewed online but cannot be processed automatically.

Examples: an image in JPG or PNG format, or a scanned document in PDF format.

★★ *Two stars*

All the above, plus:

- Structured data or documents.
- Can be processed automatically.
- Proprietary format (not open).

Example: a spreadsheet in Microsoft Excel format.

★★★ *Three stars*

All the above, plus:

- Structured and open (non-proprietary) format.

Example: a spreadsheet in CSV format (values separated by commas) instead of Microsoft Excel format.

★★★★ *Four stars*

All the above, plus:

- The data can be referenced with persistent web addresses or uniform resource locators (URIs).
- The W3C's standard open formats (RDF and SPARQL) are used to describe the information semantically.

Example: representation in the RDF model (resource description framework) of a public body's buildings, with its contact details and location, automatic data that can be accessed with web addresses (URIs).

★★★★★ *Five stars*

All the above, plus:

- Data linked to other, external datasets to provide context for the information.
- Semantic relationships are established between the linked information.

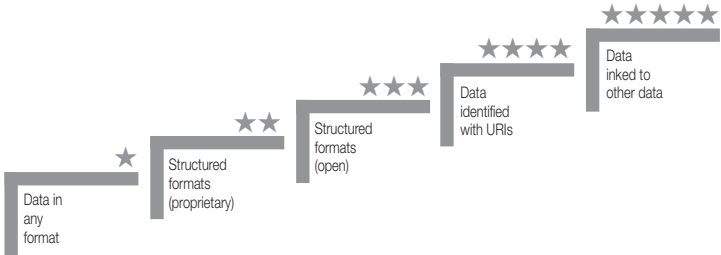
Example: in the previous case, the descriptions of the location of public buildings can be enriched with links to Geonames,<sup>16</sup> a major specialised database of geographical locations. With these lists, a detailed descrip-

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16. <http://www.geonames.org>

tion of the locations, regions or countries can be included, and there can be direct access to socio-economic and toponymic data about these locations.

**Illustration 6.** *Classification of open data initiatives*



Technical excellence – five stars – is achieved when the data are linked to other resources on the web via semantic mechanisms, which offer full interoperability between different systems and enable much more efficient subsequent re-use.

## Open Data and Re-Use Promotion Initiatives

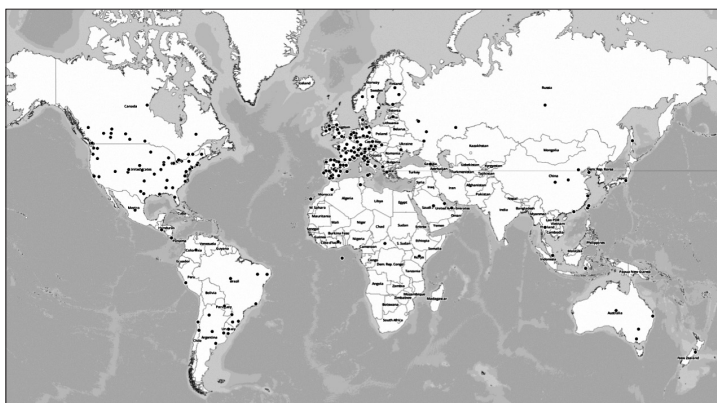
According to the inventory of open data initiatives run and maintained by CTIC,<sup>17</sup> there are around 300 open data portals around the world<sup>18</sup> (see Illustration 7. Map of open data initiatives around the world (CTIC catalogue on CartoDB) Mapa d’iniciatives *open data* arreu del món (Catàleg CTIC sobre CartoDB)). The majority of these projects are managed by governmental institutions of all levels: local, regional, national and supranational. However, approximately 10% of them are run by groups of citizens, universities or individuals.

17. <http://www.fundacionctic.org>

18. <http://datos.fundacionctic.org/sandbox/catalog/>



Illustration 7. *Map of open data initiatives around the world (CTIC catalogue on CartoDB)*



Although it was not until 2007 that the Government of the District of Columbia (US) created what is considered the **first public authority portal exclusively for open data**,<sup>19</sup> some public institutions in certain sectors – such as geographical and statistical agencies – already had data disclosed on their websites, offering the possibility of re-use. That is the case for the United Nations Statistics Division, which also offers, through its UNData<sup>20</sup> portal, data from the various agencies that make up the United Nations, while other national statistics agencies do the same. Starting in 2009, motivated by the commitment of the US President, Barack Obama,<sup>xxiv</sup> and the influence of his government, there has been constant growth in the number of these initiatives being launched.

### European-Level Initiatives

In its Digital Agenda for Europe, the European Commission sets out a specific action on “Opening up PSI resources for their re-use”, as part of one of the key elements of its promotion of the digital single market. This action includes specific activities aimed at disseminating and

19. <http://data.dc.gov>

20. <http://data.un.org>

promoting these initiatives in various sectors, both public and private, including civil society.

One of the activities promoted by the Commission has been the creation and maintenance of the European Public Sector Information Platform (ePSI<sup>21</sup>), a central point containing information related to PSI re-use in Europe. As well as keeping news up-to-date, it gathers opinions from a worldwide network of experts, creates informative reports and organises events aimed at enriching the community.

As well as this platform, the European Commission has developed the European Union Open Data Portal,<sup>22</sup> which makes available PSI from the European institutions and bodies; in the near future, it will implement the pan-European open data portal, a catalogue that brings together the datasets kept and disclosed by the various initiatives of the governments of each of the 28 EU Member States. This pan-European portal will be based on another already-existing one (publicdata.eu) that has, to date, been developed and maintained by the Open Knowledge Foundation.<sup>23</sup>

### Initiatives within Spain

In Spain, over 50 public institutions<sup>xxxv</sup> – local, regional and central – have been promoting open data and/or transparency measures. The governments of the autonomous communities of Asturias (Open Data del Principado de Asturias 2014<sup>24</sup>), the Basque Country (Open Data Euskadi<sup>25</sup>) and Catalonia (Dades Obertes de la Generalitat de Catalunya), as well as Zaragoza City Council (Datos abiertos de Zaragoza<sup>26</sup>), were the first to launch their initiatives, in 2010.

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21. <http://epsiplatform.eu>

22. <https://open-data.europa.eu>

23. <https://okfn.org>

24. <http://www.asturias.es/portal/site/webasturias/menuitem.a76385ecc651687bd9db8433f2300030/?vgnextoid=698b5d0cfd524410VgnVCM100000ce212b0aRCRD>

25. <http://opendata.euskadi.net>

26. <http://datos.zaragoza.es>

This is a movement that is constantly moving forwards and increasingly has the support of senior political figures. Nevertheless, there are isolated backward steps in this development, motivated largely by lack of commitment from the government of the day. One example is the city of Cordoba, which developed and launched its open data portal in 2011, following central government investment of EUR 382,000;<sup>xxxvi</sup> one year later, this portal was de-activated, with no apparent explanation.

Regardless of the political commitment to each initiative, it must be stressed that high-quality technology is used for many of these portals, which incorporate semantic components of linked data.

### *Activist Groups and Communities within Spain*

Apart from official initiatives, promoted by the various public authorities, there are civic groups or individuals that participate actively in promoting or improving open data and transparency initiatives, and that even manage to create their own projects. One example is the case of OpenGov.es,<sup>27</sup> a website created by lawyer Javier de la Cueva, which makes public unrestricted datasets using web scraping techniques, or by producing its own data by processing public sources.

– **Open Data Spain Community Group**<sup>28</sup> – also known as the Zaragoza Group, as it was established<sup>xxxvii</sup> in that city in 2012 – is an open group that brings together over 50 representatives of various open data, reuse, citizen and technology groups. This forum for exchanging ideas under the W3C banner has sought to take advantage of synergies between initiatives with shared challenges and, through several work groups, has designed common vocabularies, formats and models for improving interoperability and promoting the adoption of standards in central government initiatives. This group has drafted technological and strategic proposals for harmonising initiatives, such as common ontologies or vocabularies, or the best practices of the *Decálogo open data*.<sup>xxxviii</sup>

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27. <http://opengov.es>

28. <http://www.w3.org/community/opendataspain/>

- **Open Knowledge Foundation**<sup>29</sup> is a not-for-profit entity registered in the United Kingdom, which has over 50 local groups scattered all over the world. It was established in Spain in 2012,<sup>30</sup> comprising over 50 partners, in order to promote open knowledge from various perspectives, to improve governance, culture, research and the economy.
- **OpenKratio**<sup>31</sup> – a name derived from joining the word ‘open’ and ‘*kratio*’, from the word ‘*demokratio*’ (‘democracy’ in Esperanto) – is a group established in Seville in response to the concerns of a group of citizens wanting to instil the principles of open government and open data in society and, especially, in public authorities. This national-level group aims to raise awareness of these issues via initiatives relating to dissemination, participation, collaboration and carrying out projects in the public and political arenas.
- **Fundació Ciutadana Civio**<sup>32</sup> is a not-for-profit organisation that campaigns to improve democracy in Spain, targeting genuine government transparency and free access to PSI through a society based on activism and participation.
- **Access Info**<sup>33</sup> is a human rights organisation created in 2006, dedicated to promoting and protecting access to information in Europe and worldwide, which it considers a fundamental right that is essential for participation in government decision making.
- **Transparency International (TI)** is a non-governmental and not-for-profit international organisation dedicated to combating corruption at national and international level. TI has a chapter in Spain, which promotes accountability in the various types of public authority, and evaluates the openness of information and the transparency of these institutions towards society and the public. TI-Spain regularly publishes several benchmark indices that evaluate the state of public authorities in Spain. These are the indices of transparency in local authorities (ITA), in autonomous-community governments (INCAU),

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29. <https://okfn.org>

30. <https://okfn.org/network/spain/>

31. <http://openkratio.org>

32. <http://www.civio.es>

33. <http://www.access-info.org>

in water management (INTRAG), provincial councils (INDIP), and in regional and national parliaments (IPAR).

– **Catalunya Dades**<sup>34</sup> is a network of organisations (public, private, associations, etc.) that seeks the involvement of Catalan society in processes of creating value from open knowledge and data. This interesting experiment aims to change the vision and types of behaviour of actors on the public stage (officials, citizens, suppliers, etc.) regarding openness and re-use in relation to data and knowledge in general by:

- a) Sharing all types of resource and best practice between all Catalan public authorities and re-user organisations.
- b) Holding events to promote open data and, where appropriate, to develop applications with re-used data.
- c) Preparing materials (files, manuals, standards, etc.) for use by all Catalan public authorities.
- d) Educating Catalan people and organisations about openness and re-use in relation to data.

There are other groups also related to open data, albeit more focused on specific issues like geographic information, semantic interoperability, etc.

### **Promoting Re-Use**

An open data initiative does not stop once the data have been disclosed on the portal; rather, the institution itself is responsible for properly maintaining the datasets and resources made public, and promoting their re-use. Commitment to maintaining and updating the information is vital to the success of many re-use projects, which could not be useful or competitive without access to high-quality and rigorously updated information.

Public authorities should establish means of communication with potential groups of re-users, and encourage them to make use of the resources made available to them. These channels could be physical

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34. <http://catalunyadades.cat>

(periodic meetings, dissemination events, promotion in the media, etc.) or virtual (dedicated spaces on social media or the web).

A common mechanism that produces successful results is holding programming marathons known as ‘hackathons’, not in the sense of cybercrime, but meaning playful programming activities. These bring together programmers, designers, data journalists and any other people who may have ideas about potential data re-use to generate applications based on open data or resources. Very often, in parallel to the hackathons, a competition is held with a prize for the best ideas or products produced.

A good example of such an initiative is Apps for Europe,<sup>35</sup> a network to help developers of data-based computer applications turn their products into viable businesses. This project uses events for programmers held in various European cities to bring developers and investors together, as well as to reward the best ideas via a competition.<sup>36</sup>

Another significant example is the work of the US not-for-profit organisation Code for America,<sup>37</sup> founded in 2009 to bring the public and private sectors closer together by using technology appropriately and efficiently. This project is supported by government and funded by major companies.<sup>xxxix</sup> They do this by helping to foster the participation of the general public in their community, with the aim of resolving day-to-day problems and of boosting the potential of emerging new companies.

The United Kingdom has set the standard for open PSI since it launched its Open Data Portal in 2010, and it is now doing so as regards re-use. This is partly thanks to the Open Data Institute (ODI),<sup>38</sup> an entity funded<sup>39</sup> by the UK Government, which aims to create eco-

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35. <http://www.appsforeurope.eu>

36. <http://www.appsforeurope.eu/competition>

37. <http://codeforamerica.org>

38. <http://theodi.org>

39. The ODI has received GBP 10 million (EUR 12.5 million) over five years in state funding to cover its running costs.

conomic, social and environmental value by cultivating openness and re-use in relation to PSI.

These are just some of the hundreds of examples of projects promoting openness and re-use in relation to PSI around the world.

## **Towards *Smart* Governance**

Another of the issues that local governments include in digital agendas is the move towards what are known as *smart cities*. This concept is essentially based on improving public services and making cities more sustainable through efficient management of resources and technologies.

One of the purposes of creating such cities has been **economic, energy, waste-management and pollution-reduction efficiency**. Apart from managing the environment, mobility and city planning, another important issue for these cities is the need for *smart governance*, based on the concept of open government and making use of public resources. This is where the volume of data handled by the cameras and sensors scattered across the city comes into play: those installed under the asphalt to monitor traffic; those measuring air quality and the environment (pollution, pollen levels, radioactivity or heavy metals, etc.); those monitoring road traffic; those monitoring water levels in rivers and on beaches; etc.

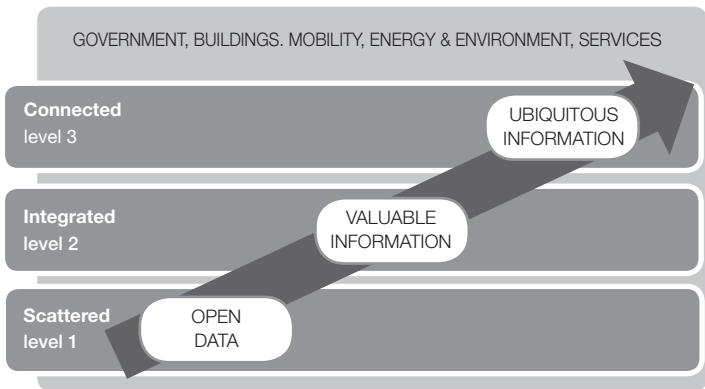
All these are used essentially by technical teams for city planning, road safety or traffic, but the major potential of this information lies in opening it up so that anyone can make use of these rich and dynamic databases.

In the *smart city* maturity model,<sup>xl</sup> IDG sets out a strategy for developing *smart cities*, with five core areas (government, buildings, mobility, energy & environment, and services) and three stages of maturity level (scattered, integrated and connected), depending on the amount of data and the related levels of integration with the city. This study analyses the progression between the different maturity levels, based on

the integration of information systems and the quality of information on each status:

- At a low maturity level, **open data** already exist. The city discloses data through its web portal as standard, for all audiences and re-users.
- Open data become **valuable information** when the city reaches the next maturity level, putting the information into context by means of integrating with different systems and facilitating access to and use of the data.
- Ubiquitous information characterises the highest maturity level for a *smart city*, when the government proactively makes available the **specific information requested by each potential re-user**. This is possible thanks to advanced computing and the ‘Internet of Things’, in which any sensor or electronic device forming part of the street furniture is connected to other devices over the Internet.

**Illustration 8.** *Progression towards smart cities (IDC Energy Insights, 2011)*



## Big Data and Small Data

A *smart city* should encourage innovation by the public, and try to work with the city's people and companies to the greatest extent possible. There are numerous possible means of public-private co-operation.



One of the greatest potential benefits for the governance of a city is the possibility that it will be the citizens who gather the data, and that they become part of the supply chain for the information required to improve the city's management processes. This data capture can be manual, using specific applications, or automatic, from sensors that members of the public could themselves carry. This is an area offering infinite possibilities for working together, since there are ever-more devices capable of recording and processing this drip-drip of small data: sensors fitted in housing that measure environmental characteristics and weather variations (for example, they make use of Arduino,<sup>40</sup> the open-source platform for producing electrical circuits); those incorporated into accessories that can be *worn* (bracelets, watches, rings, clothes with built-in sensors, or anything else that monitors activity or vital signs and is worn on the body); and even making use of sensors built into smartphones (gyroscopes, GPS receivers, temperature, atmospheric pressure, etc.).

The mass capture of detailed data by citizens could offer public authorities a large amount of high-quality and reliable information on the habits and behaviour of the population, which is something of great value and significance in this search for maximum efficiency. The processing of these data, combined with information from the public authority itself, could enable studies and usages based on the processing and analysis of these large volumes of information, also known as big data.

One example that illustrates this idea of public involvement allied with the generation of business by industry is the recent contract signed in the United States between the Oregon Department of Transportation (ODOT) and the private company Strava,<sup>41</sup> a social network based on an application for mobile devices used by some 10 million people all over the world.<sup>xii</sup> Specifically, ODOT paid USD 20,000 (EUR 15,000)

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40. <http://www.arduino.cc>

41. <http://www.strava.com> Application that enables storage and monitoring of routes taken when users are out cycling or running, thanks to the GPS receivers in their devices.

for the licence to use and profit from a dataset with information on the activities of 17,700 users. ODOT bought this dataset for the purposes of efficient improvement of road planning and transportation management in the region, based on realistic analysis of the actual habits of its citizens.

The data and resources that the public authority will be able to access are of great value and, thanks to these examples and many others, the major potential that this has for the development of society as a whole can be understood.

- i. CIS. *Informe 3024/0-0. Barómetro de mayo 2014* [online]. CIS, May 2014. <[http://www.cis.es/cis/export/sites/default/-Archivos/Marginales/3020\\_3039/3024/es-3024mar.html](http://www.cis.es/cis/export/sites/default/-Archivos/Marginales/3020_3039/3024/es-3024mar.html)>
- ii. PARKS, W. *The Open Government Principle: Applying the Right to Know Under the Constitution*, 26 Geo. Wash. L. Rev. 1 October 1957
- iii. HARRISON, T.M. *et al. Open Government and E-Government: Democratic Challenges from a Public Value Perspective* [online]. <[http://www.ctg.albany.edu/publications/journals/dgo2011\\_opengov/dgo2011\\_opengov.pdf](http://www.ctg.albany.edu/publications/journals/dgo2011_opengov/dgo2011_opengov.pdf)>
- iv. LATHROP, Sr. and RUMA. L. *Open Government: Collaboration, Transparency, and Participation in Practice*. O'Reilly Media, Inc., 2010.
- v. European Commission. Directorate-general for Communications Networks, Content and Technology. *A vision for public services* [online]. <[http://ec.europa.eu/information\\_society/newsroom/cf/dae/document.cfm?doc\\_id=3179](http://ec.europa.eu/information_society/newsroom/cf/dae/document.cfm?doc_id=3179)>
- vi. MÁRQUEZ, J.M. *et al. Estudio de la demanda y uso de gobierno abierto en España* [online]. February 2013. <[http://www.ontsi.red.es/ontsi/sites/default/files/demanda\\_y\\_uso\\_de\\_gobierno\\_abierto\\_en\\_espana.pdf](http://www.ontsi.red.es/ontsi/sites/default/files/demanda_y_uso_de_gobierno_abierto_en_espana.pdf)>
- vii. European Commission. *European eGovernment Action Plan 2011-2015* [online]. <<http://ec.europa.eu/digital-agenda/en/european-egovernment-action-plan-2011-2015>>
- viii. MALAMUD, C. *et al. Open Government Data Principles* [online]. <[https://public.resource.org/8\\_principles.html](https://public.resource.org/8_principles.html)>
- ix. PACE, S. *et al. "Appendix B. GPS History, Chronology, and Budgets", The Global Positioning System: Assessing National Policies*. Rand (Ed.), 1995. ISBN: 0-8330-2349-7.
- x. UK Government. Cabinet Office. *G8 Open Data Charter and Technical Annex* [online]. 18 June 2013. <<https://www.gov.uk/government/publications/open-data-charter/g8-open-data-charter-and-technical-annex>>
- xi. UK Government. Prime Minister's Office. *G8 Lough Erne Declaration* [online]. 18 June 2013. <<https://www.gov.uk/government/publications/g8-lough-erne-declaration/g8-lough-erne-declaration-html-version>>
- xii. ASEDIE. *Infomediary Sector Report* [online]. November 2013. <<http://www.asedie.es/images/informes/SectorInfomediario/asedie%20infomediary%20sector%202013.pdf>>
- xiii. Danish Ministry of the Environment. Danish Geodata Agency. *Danmarks frie geodata i en Minecraft-verden* [online]. April 2014. <<http://gst.dk/emner/frie-data/minecraft/>>
- xiv. Ordnance Survey. *Ordnance Survey uses US OpenData to create a Minecraft map of Great Britain* [online]. 24 September 2013. <<http://www.ordnancesurvey.co.uk/about/news/2013/minecraft-map-of-great-britain.html>>
- xv. GONZÁLEZ, E. *Open Data and Gamification III* [online]. September 2014. <<http://datos.fundacionctic.org/2014/06/minecraft-gjjon/>>
- xvi. European Commission. *Gallileo, Europe's GPS, opens up business opportunities and makes life easier for citizens* [online]. Brussels, 24 July 2013. <[http://europa.eu/rapid/press-release\\_MEMO-13-718\\_en.htm](http://europa.eu/rapid/press-release_MEMO-13-718_en.htm)>

- xvii. VICKERY, G. *Review of recent studies on PSI re-use and related market developments* [online]. 2011. <[http://ec.europa.eu/information\\_society/newsroom/cf/document.cfm?doc\\_id=1093](http://ec.europa.eu/information_society/newsroom/cf/document.cfm?doc_id=1093)>
- xviii. EAVES, Sr. *Case Study: How open data saved Canada \$3.2 billion* [online]. 14 April 2013. <<http://eaves.ca/2010/04/14/case-study-open-data-and-the-public-purse/>>
- xix. Danish Enterprise and Construction Authority. *The value of Danish address data: Social benefits from the 2002 agreement on procuring address data etc. free of charge* [online]. 7 July 2010. <[http://www.adresseinfo.dk/Portals/2/Benefit/Value\\_Assessment\\_Danish\\_Address\\_Data\\_UK\\_2010-07-07b.pdf](http://www.adresseinfo.dk/Portals/2/Benefit/Value_Assessment_Danish_Address_Data_UK_2010-07-07b.pdf)>
- xx. Ministry of Industry, Energy and Tourism, Ministry of Finance and Public Authorities. *Guía de aplicación del Real decreto 1495/2011 por el que se desarrolla la Ley 37/2007 sobre reutilización de la información del sector público* [online]. Madrid, June 2012. <<http://datos.gob.es/sites/default/files/PLANCISP-GRD-07.3.41.pdf>>
- xxi. National Information Standards Organisation. *Understanding Metadata* [online]. NISO Press, 2004. ISBN: 1-880124-62-9. <<http://www.niso.org/publications/press/UnderstandingMetadata.pdf>>
- xxii. ARCHER, P. *et al. Report on high-value datasets from EU institutions* [online]. European Commission, 8 May 2014. <<https://joinup.ec.europa.eu/sites/default/files/6c/a4/e9/ISA%20Programme%20-%202014%20-%20Report%20on%20high-value%20datasets%20from%20EU%20institutions.pdf>>
- xxiii. Environmental Systems Research Institute. *ESRI Shapefile Technical Description* [online]. July 1998. <<http://www.esri.com/library/whitepapers/pdfs/shapefile.pdf>>
- xxiv. European Commission. *Guidelines on recommended standard licences, datasets and charging for the reuse of documents* [online]. 24 July 2014 <[http://eur-lex.europa.eu/legal-content/ES/TXT/PDF/?uri=CELEX:52014XC0724\(01\)&from=EN](http://eur-lex.europa.eu/legal-content/ES/TXT/PDF/?uri=CELEX:52014XC0724(01)&from=EN)>
- xxv. VRIES, M. *et al. Pricing Of Public Sector Information Study. Models of Supply and Charging for Public Sector Information (ABC)* [online]. European Commission Directorate-General for the Information Society and Media, October 2011. <[http://ec.europa.eu/information\\_society/newsroom/cf/dae/document.cfm?doc\\_id=1158](http://ec.europa.eu/information_society/newsroom/cf/dae/document.cfm?doc_id=1158)>
- xxvi. "Directive 2003/98/EC of the European Parliament and of the Council of 17 November 2003 on the re-use of public sector information". *Official Journal of the European Union*, 31 December 2003. <<http://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32003L0098&from=EN>>
- xxvii. "Directive 2013/37/EU of the European Parliament and of the Council of 26 June 2013 on the re-use of public sector information". *Official Journal of the European Union*, 27 June 2013. <<http://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32013L0037&from=EN>>
- xxviii. "Ley 37/2007, de 16 de noviembre, sobre reutilización de la información del sector público". *Official State Gazette (BOE)*, 17 November 2007, number 276. <<http://www.boe.es/boe/dias/2007/11/17/pdfs/A47160-47165.pdf>>
- xxix. "Real Decreto 1495/2011, de 24 de octubre, por el que se desarrolla la Ley 37/2007, de 16 de noviembre, sobre reutilización de la información del sector público, para el ámbito del sector público estatal". *Official State Gazette (BOE)*, 8 November 2011, number 269. <<http://www.boe.es/boe/dias/2011/11/08/pdfs/BOE-A-2011-17560.pdf>>

- xxx. "Law 19/2013, of 9 December, on transparency, access to information and good governance". *Official State Gazette (BOE)*, 10 December 2013, number 295. <<http://www.boe.es/boe/dias/2013/12/10/pdfs/BOE-A-2013-12887.pdf>>
- xxxii. Access Info. ¿Por qué la futura ley de transparencia española es insuficiente? [online]. <<http://www.access-info.org/index.php/es/espana/375-¿por-que-la-futura-ley-de-transparencia-espanola-es-insuficiente?>>
- xxxiii. European Commission. *Annex SPAIN to the EU Anti-Corruption Report* [online]. Brussels, 3 February 2014. <[http://ec.europa.eu/dgs/home-affairs/what-we-do/policies/organized-crime-and-human-trafficking/corruption/anti-corruption-report/docs/2014\\_acr\\_spain\\_chapter\\_en.pdf](http://ec.europa.eu/dgs/home-affairs/what-we-do/policies/organized-crime-and-human-trafficking/corruption/anti-corruption-report/docs/2014_acr_spain_chapter_en.pdf)>
- xxxiv. BERNERS-Lee, T. *Linked Data – Design Issues* [online]. 27 July 2007 <<http://www.w3.org/DesignIssues/LinkedData.html>>
- xxxv. The White House. *Obama Administration Releases Historic Open Data Rules to Enhance Government Efficiency and Fuel Economic Growth* [online]. 9 May 2013. <<http://www.whitehouse.gov/the-press-office/2013/05/09/obama-administration-releases-historic-open-data-rules-enhance-governmen>>
- xxxvi. MEIJUEIRO, L. *Map of current open data initiatives in Spain* [online]. CTIC Open Data, 26 March 2014. <<http://datos.fundacionctic.org/2014/03/mapa-actual-de-las-iniciativas-open-data-en-espana/>>
- xxxvii. MARZO, I. *Nace la plataforma Open data Córdoba buscar empleo o crear empresas* [online]. Diario de Córdoba, 22 March 2011. <[http://www.diariocordoba.com/noticias/cordobalocal/nace-plataforma-open-data-cordoba-buscar-empleo-crear-empresas\\_625578.html](http://www.diariocordoba.com/noticias/cordobalocal/nace-plataforma-open-data-cordoba-buscar-empleo-crear-empresas_625578.html)>
- xxxviii. ÁLVAREZ, M. *Lanzamiento de la Comunidad Open Data* [online]. Open Data Spain, 28 February 2012. <<http://red.gnoss.com/en/community/OpenData/resource/lanzamiento-de-la-comunidad-open-data/74c7a9f9-5a32-473d-a610-54ea7c1eea3e>>
- xxxix. ÁLVAREZ, M., *Decálogo Open Data* [online]. Open Data Spain, 28 May 2012. <<http://red.gnoss.com/en/community/OpenData/resource/decalogo-open-data/58581882-63aa-4bc5-9033-90cf81f78793?>>>
- xl. BILTON, N. *Changing Government and Tech with Geeks* [online]. The New York Times Blogs, 6 July 2010. <<http://bits.blogs.nytimes.com/2010/07/06/changing-government-and-tech-with-geeks/>>
- xli. ACHAERANDIO, R. *et al. Smart Cities Analysis in Spain 2012 – The Smart Journey* [online]. IDC Spain, September 2012. <[http://www.portalidc.com/resources/white\\_papers/IDC\\_Smart\\_City\\_Analysis\\_Spain\\_EN.pdf](http://www.portalidc.com/resources/white_papers/IDC_Smart_City_Analysis_Spain_EN.pdf)>
- xlii. LOIZOS, C. *A VC Lets a Bet Ride: the Story of Strava* [online]. PeHUB, Thomson Reuters, 19 March 2013. <<http://www.pehub.com/2013/03/a-vc-lets-big-bet-ride/>>