European Data Portal

Open Data Maturity in Europe 2015

Insights into the European state of play

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Abstract

To offer tailored support to European countries to improve their Open Data activities, the status of the EU28 and European Free Trade Association (EFTA) countries –referred to as EU28+ – is assessed. To measure Open Data Maturity two key indicators have been selected. These indicators cover both the maturity of national policies promoting Open Data as well as an assessment of the features made available on national data portals.

The EU28+ countries completed close to 45% of the Open Data journey, with 87% of the countries having a national Open Data portal in place. Almost two-thirds of the EU28+ countries have integrated a dedicated Open Data policy. However, Portal Maturity scored 40.8%. Looking at the spread of the overall scores, three different maturity levels are identified: Beginners, Followers and Trend Setters.

Finally, a series of recommendations have been formulated to guide countries in achieving higher Open Data maturity. In addition to an Open Data strategy, countries need to extend the functionalities on their portals, raise awareness around Open Data, offer further training and national guidelines to support local initiatives. Finally, measuring the success of an Open Data initiative can help identify benefits more clearly, as well as further room for improvement.

Résumé

Afin de soutenir les pays européens dans leur démarche d'ouverture des données publiques, la maturité « Open Data » des 28 pays de l'UE ainsi que les pays de l'Association européenne de libre-échange (AELE), dénommés UE28+ - a été évaluée. Deux indicateurs clés sont utilisés. Ces indicateurs couvrent à la fois la maturité des politiques nationales visant à promouvoir l'ouverture des données publiques ainsi qu'une évaluation des fonctions disponibles sur les portails nationaux.

L'UE28+ a réalisé près de 45 % du chemin, avec 87 % des pays ayant un portail «Open Data» national en place. Près des deux tiers des pays de l'UE28 + disposent d'une politique soutenant l'ouverture des données. Toutefois, la maturité moyenne des portails nationaux n'est que de 40,8 %. La maturité « Open Data» des différents pays s'établit sur trois niveaux : débutant, suiveur et précurseur.

Enfin, une série de recommandations a été formulée de manière à guider les pays pour parvenir à une plus grande maturité « Open Data ». Outre une stratégie soutenant l'ouverture des données, les pays ont besoin d'étendre les fonctionnalités disponibles sur leurs portails ; de communiquer davantage sur l'ouverture des données ; de proposer de formations ainsi que des lignes directrices nationales pour soutenir des initiatives locales. Enfin, mesurer le succès d'une initiative « Open Data peut contribuer à identifier plus clairement les bénéfices escomptés, ainsi que des améliorations à apporter à l'avenir.

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Executive summary

The public sector is providing increasing amounts of Open (Government) Data free of charge. Open Data refers to the information collected, produced or paid for by public bodies and can be freely used, modified and shared by anyone for any purpose.

Where do European countries stand with regard to Open Data? What key policies have been set up? What are the key features of national data portals? The countries covered in this assessment are the EU28 countries plus Iceland, Liechtenstein, Norway and Switzerland – commonly referred to as the EU28+ countries.

To measure Open Data Maturity two key indicators have been selected. These indicators cover both the maturity of national policies promoting Open Data as well as an assessment of the features made available on national data portals. The two key indicators consist therefore of Open Data Readiness and Portal Maturity. Open Data Readiness looks at the presence of Open Data policies, at the use made of the available Open Data, and at the political, social and economic impact of Open Data. Portal Maturity measures the usability of a web based Open Data portal with regard to the availability of functionalities, the overall re-usability of data, as well as the spread of data. The two key indicators as well as the sub indicators are depicted in Table 1.

Open Data Maturity Assessment							
Open Data Readiness					Portal maturity		
1. Presence of Open Data Policy	2. Licensing Norms	3. Extent of coordination at national level	4. Use of Data	5. Impact of Open Data	6. Usability of the portal	7. Re-usability of data	8. Spread of data across domains

Table 1 - Open Data Maturity indicators

Assessing Open Data Maturity shows that the EU28+ have completed just 44% of the journey towards achieving full Open Data Maturity, as defined in this study. However, there are large discrepancies across countries. A sub-set of them is still in the process of building their national portals whereas some others are already improving their current portals and launching new initiatives. A third of European countries (32%) are leading the way with solid policies, licensing norms, good portal traffic and many local initiatives and events.

The Open Data Readiness indicator shows an EU28+ average of 44.7%. The results of the Open Data Readiness sub indicators show that the EU28+ countries are most mature when it comes to the presence of Open Data policies. They score on average 57.4% on the presence of Open Data policies. On the use and impact of Open Data, the EU28+ countries score lower, respectively 36 and 29%.

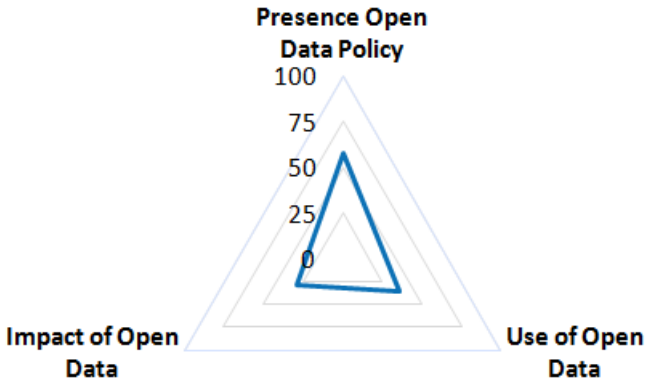


Figure 1 – EU28+ average Open Data Readiness

Almost two-thirds (59%) of the EU28+ countries have integrated a dedicated Open Data policy. With regard to licensing norms, the countries are quite developed, as the EU28+ score 72.9%. However, national coordination in the field of providing guidance to local or domain specific areas is lagging behind with an average of 43.8%.

On the use of Open Data, the EU28+ countries score low, with an average of 36%. The difference within the EU28+ is large. Several EU28+ countries already receive more than 10,000 visitors per month on their national portal. However, many countries have no insight into the use of their data.

Thanks to the present landscaping exercise, the overall political, social and economic impact of Open Data in the EU28+ can be measured. On all three factors, countries perceived that not even half of the impact has been reached. The economy is the most impacted area, scoring an average of 38.3%, the political impact achieved is 30.8%, and finally the perceived social impact remains very low at 8.3%.

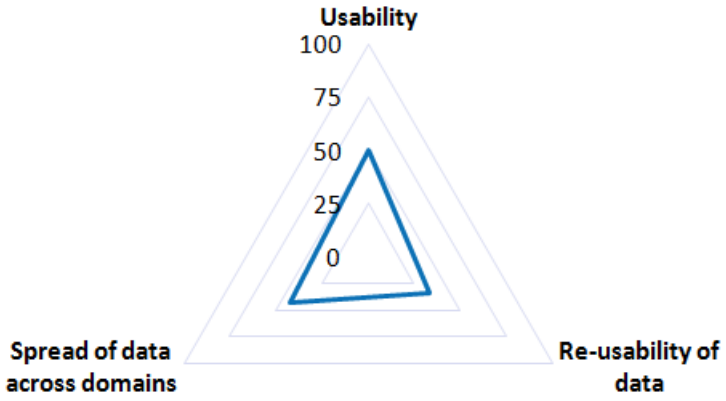


Figure 2 – EU28+ average Portal Maturity

The maturity of the Open Data portals is the second key indicator of the Open Data Maturity Assessment. Portal maturity looks at the usability and the re-usability of the portal, as well as the spread of data across domains. The EU28+ countries score on average 40.8%. Overall, the EU28+ countries score 50% on usability, 33% on re-usability, and 42% on the spread of data across domains.

Based on these results, the EU28+ are clustered into three different levels of Open Data Maturity:

Beginners: the initial steps have been made, but countries still struggle with basics around availability and accessibility. Portal functionalities remain limited and there is a limited coverage in terms of data sets.

Followers: the basics are set, including a clear vision and there are advanced features on the portal. However, the approach to the release of data is very much in silo and remains limited.

Leaders – Trend Setters: these are the most advanced and have solid Open Data portals with elaborate functionalities and coordination mechanisms across domains.

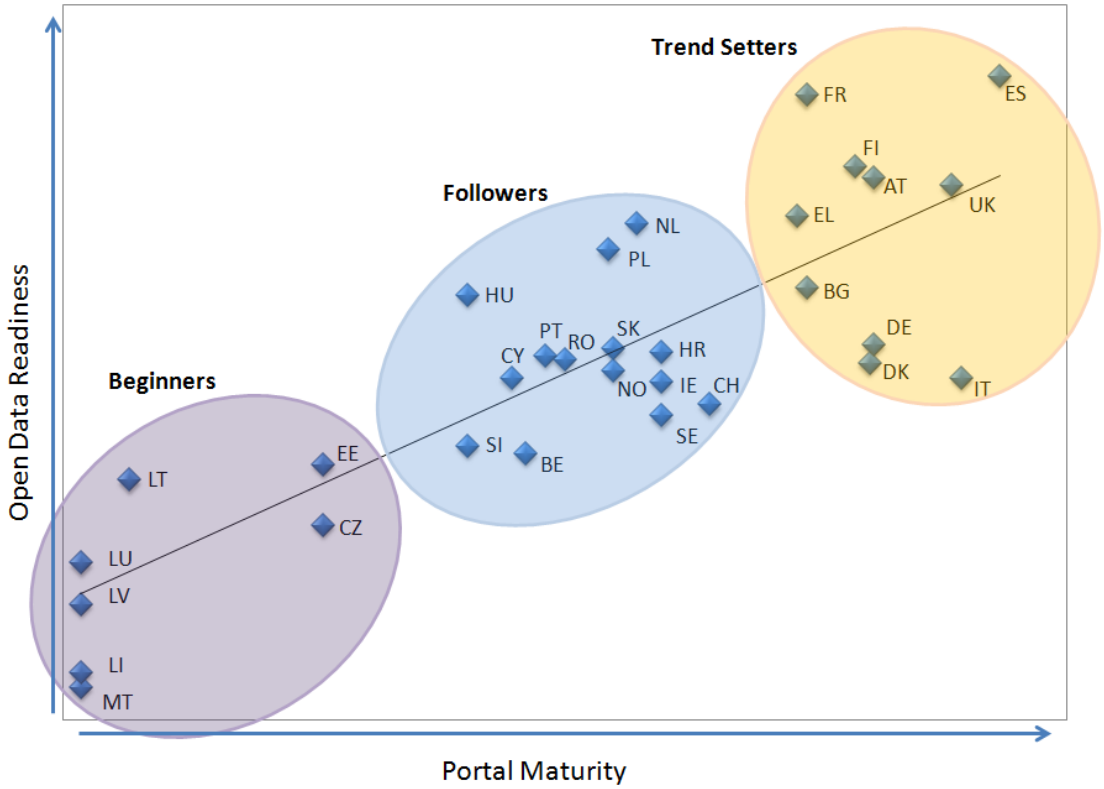


Figure 3 - EU28+ Open Data Maturity clusters

A number of barriers remain in reaching further Open Data Maturity across the EU28+. These barriers are similar across countries and are categorised as political, legal and technical barriers. In addition, barriers appear around communication and user-engagement.

In order to move forward with regard to Open Data Maturity, a series of recommendations have been formulated for the EU28+ countries:

- An Open Data strategy is needed as a basis for cooperation across public administrations and engaging further with potential re-users;
- Adding basic functionalities on a portal can increase user friendliness and stimulate re-use;
- Awareness among citizens and businesses around Open Data should be increased; and
- Trainings should be offered to civil servants to increase understanding of Open Data;
- The development of national guidelines dealing with issues such as priority domains and frequency of data release can help support local initiatives;
- Measuring the success of an Open Data initiative can help identify benefits and room for improvement.

In addition, data from other European countries was also collected: Albania, Bosnia and Herzegovina, Kosovo, Serbia, Montenegro and Turkey. These EU candidate countries[1] are also at the beginning of their journey as they start launching Open Data policies. With regard to Open Data Maturity, all EU candidate countries can be categorised as Beginners. These countries score on average 14.0%.

This landscaping offers clear insight into where all European countries stand on their Open Data journey. This study will serve as the knowledge base to help build a European leaders' network of experts and to dive deeper into national activities. Revisions of this study are planned for 2016 and 2017.

[1] For the purpose of this report, by 'EU candidate countries' we mean also the potential candidates Bosnia and Herzegovina and Kosovo.

1. Introduction

Freedom of Information laws allow citizens to have access to data held by national governments. Over the past 50 years, these laws have been progressively introduced across Europe. The fact that a citizen had the right to know everything about the government meant that all the data was available somewhere for citizens to access and to make use of it. However, the information was available upon request and was not necessarily free of charge. The next step concerning Freedom of Information is leading towards the free provision of more and more reusable information collected by the public sector, commonly called Public Sector information (PSI). This is often referred to as providing Open (Government) Data. The principles for Open Data are described in detail in the Open Definition: Open Data refers to the information collected, produced or paid for by public bodies and can be freely used, modified, and shared by anyone for any purpose.[2]

Figure 4 - Open Data definitions[3]

In 2003, the European Commission adopted the PSI Directive as a minimum harmonisation measure, helping remove major barriers to re-use PSI by regulating the behaviour of public sector bodies. The Directive provides a common legal framework for a European market for government-held data (PSI). A revision of the PSI Directive was introduced in 2013.[4] The main amendments are the breakaway from cost-based charging for PSI towards a margin-oriented fee, inclusion of certain cultural institutions as public sector bodies, increased transparency regarding calculation of the fees, and support to machine-readable and open formats. Currently, all European countries are in the process of completing the transposition of the revised PSI Directive.

Several studies estimated the potential economic value of PSI. Recently, more studies underline the importance of Open Data for economic growth. The economic study conducted by the European Data Portal team estimates that between 2016 and 2020, the market size of Open Data is expected to increase by 36.9% to a value of 75.7 bn EUR in 2020[5]. It stimulates innovation and the development or enhancement of products and services. To reach the positive economic impact of

[2] http://opendefinition.org/
[3] http://europeandataportal.eu/elearning/en/module1/#/id/co-01
[4] http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=celex:32013L0037
[5] European Union, 2015. Creating Value through Open Data.

Open Data, data must be accessible, reusable, and re-used. Citizens and businesses are only able to use data if the data is made available. They depend on the information that governments publish. Therefore, it is important to look at the current state of play in Europe. At the end of 2015, most European countries have developed a national Open Data portal. An Open Data portal is the central point to go to for searching and downloading Open Data. However, there is a huge difference in data quantity and quality between the different European data portals.

Multiple monitoring initiatives exist, such as the Open Data Index[6], the Open Data Barometer[7], the Open Data Monitor[8], and the ePSI platform Scoreboard[9]. However, none of these initiatives has adopted a comprehensive approach encompassing the political setting favourable to Open Data, the expected impact of Open Data, the development of portals and their maturity and finally the main barriers faced. This is the purpose of the present assessment.

The aim of this landscaping is to obtain an overview of the maturity of Open Data for each of the EU28 countries plus Iceland, Liechtenstein, Norway and Switzerland: the EU28+ countries. In addition, data from other European countries was also collected: Albania, Bosnia and Herzegovina, Kosovo, Serbia, Montenegro and Turkey. This document is the first assessment in a series of three annual studies. Revisions of this study are planned for 2016 and 2017. This study will serve as the knowledge base to help build a European leaders' network of experts and to dive deeper into national activities, to understand where to provide common support activities, and where to offer further specialised training and coaching assistance.

[6] http://index.okfn.org/
[7] http://www.opendatabarometer.org/
[8] http://project.opendatamonitor.eu/
[9] http://www.epsiplatform.eu/

2. Approach to assessing Open Data Maturity across Europe

Conducting three annual studies requires a standardized approach to ensure consistency and comparability of the findings over time. These studies are conducted within the context of the deployment of the European Data Portal and the methodology is presented in this chapter.

The European Data Portal covers a full set of activities with the ambition of contributing to deploying an infrastructure supporting the "Access to re-usable public sector information - Public Open Data".[10] The first version of the European Data Portal[11] is launched in November 2015. This portal harvests all the metadata that is available on national European portals that make available a standard API.[12] Further local portals will be harvested for the future releases of the portal. In addition to the European Data Portal, support will be provided with a series of added-value services to accompany the European countries in order to increase and/or improve their Open Data related activities. European Countries will be offered a combination of common support material and training as well as targeted support for those that are still in the early stages of the journey.

A first step in supporting the EU28+ countries consists of assessing where the countries stand on their journey to implement Open Data, increase the publication of data sets, and support the re-use of the data made available. This activity is commonly called landscaping. It consists of drawing a picture of the latest national developments with regard to Open Data. Within the European Data Portal project, better understanding the barriers faced by various countries will enable further targeted support to accelerate the set-up of a Digital Single Market for data.

2.1 Method to Assess Open Data Maturity

The focus of the landscaping is to understand the level of Open Data Maturity from the perspective of the public sector representatives. Indeed, governments are the main driver behind Open Data as they are responsible for setting up on Open Data policies, the release of public sector information and the setup of data portals. In addition, government representatives are able to provide information regarding portal traffic statistics as well as the benefits the public sector expects to witness from the implementation of Open Data policies.

To assess the Open Data Maturity of each European country an assessment model has been developed, consisting of two key indicators: Open Data Readiness and Portal Maturity.

Open Data Readiness assesses the presence of Open Data policies, licensing norms and the extent of coordination at national level when it comes to guidelines and setting common approaches. The transposition of the revised PSI directive is taken into account. Finally, the use made of the Open Data available and the perceived political, social and economic impact of Open Data are measured. The political guidelines and support of Open Data initiatives together with the extent of re-use and impact level give an overall indication of the readiness to benefit fully from the potential value of Open Data.

[10] https://ec.europa.eu/digital-agenda/en/connecting-europe-facility#digital-service-infrastructures-dsis
[11] http://ec.europa.eu/publicdata
[12] An application programming interface (API) is a set of routines, protocols, and tools for building software applications.

The second key indicator is **Portal Maturity**. This indicator measures the usability of the portal with regard to the availability of functionalities, the overall re-usability of data, as well as the spread of data across high value domains.

The two key indicators as well as the sub indicators are depicted in Table 2 and Table 3.

Open Data Maturity Assessment							
Open Data Readiness					Portal maturity		
1. Presence of Open Data Policy	2. Licensing Norms	3. Extent of coordination at national level	4. Use of Data	5. Impact of Open Data	6. Usability of the portal	7. Re-usability of data	8. Spread of data across domains

Table 2 - Open Data Maturity indicators

To offer a more comprehensive understanding of the different indicators, leading research questions were addressed. The questions are summarised in the tables below and cover each of the sub indicators of the Open Data Maturity Assessment Model, describing the ideal situation.

Open Data Readiness

Indicator	1. Presence of specific Open Data policy
1.1	Open Data policy and policies supporting re-use are in place. Open Data policy is different from the PSI policy. A national strategy does exist
1.2	National, but also regional/local portals are present. The data holders are able to upload the data themselves, the frequency of collection is provided and there is a pre-defined approach to ensure data is up-to-date.
1.3	Priority domains are identified. The public administration is using data themselves for decision-making, but promoting the use by others as well by organizing events.

Indicator	2. Licensing norms
2.1	Data is available free of charge.
2.2	Data is open licensed.
2.3	A national data policy provides for a standard license (or suite of licenses) that public sector bodies are encouraged to avail themselves of when allowing PSI re-use.

Indicator	3. Extent of coordination at national level
3.1	National guidelines on the publications of PSI are in place.
3.2	Numerous regions and/or cities run their own Open Data initiatives, like portals or specific policies, and are integrated on the national portal.

Indicator	4. Use of the data
4.1	Overview of portal traffic statistics: number of unique visitors, visitor profile, percentage human, percentage foreign, and API access.

Indicator	5. Impact
5.1 Political Impact	
5.1.1	High impact on government efficiency and effectiveness.
5.1.2	High impact on transparency and accountability in the country.
5.2 Social impact	
5.2.1	High impact on environmental sustainability in the country.

5.2.2	High impact on increasing the inclusion of marginalised groups in policy making and accessing government services.
5.3 Economic impact	
5.3.1	Multiple macro-economic studies assessing the market value of Open Data are done as well as studies regarding better service delivery or looking at related subjects.
5.3.2	The funding model is known.

Table 3 – Open Data Readiness Detailed Indicators

Portal Maturity

Indicator	**6. Usability of the portal**
6.1	Feedback mechanisms are available on the portal to comment on data set quality and get a discussion going.
6.2	Users can access data sets, search, download and contribute themselves.
6.3	A distinction is made between human and API access, indicating that an API is available.

Indicator	**7. Re-usability of the data**
7.1	The proportion of data that is machine-readable is known (Open Data Monitor).
7.2	All data is available in one – bulk – download
7.3	File formats are searchable and it is known which file format is available the most.

Indicator	**8. Spread of data across domains**
8.1.	Data sets are numerous and up-to-date
8.2	Multiple organisations provide a lot of data sets
8.3	Data sets are searchable by domain with many different domains present

Table 4 – Portal Maturity Detailed Indicators

The different steps required for the realisation of the Landscaping consist of:

- **Detailing the indicators measured and pertaining scoring.** This includes identifying how to measure certain indicators as well as listing the relevant sources of information required.
- **Leveraging existing Open Data insights by making use of the existing Open Data monitoring activities**. The findings of other projects such as the Open Data Monitor and the Open Data Barometer, Open Data Index and the ePSI scoreboard have been incorporated in the landscaping.
- **Setting up a survey to collect additional information from the European countries themselves.** A questionnaire was created and addressed to the individual country representatives from the PSI expert group,[13] chaired by the European Commission. Regarding non-EU and non-EFTA countries, the national representatives involved in the cooperation policies of the EU were addressed. The questions are divided into three main categories: presence of an Open Data policy, use of Open Data and impact of Open Data. The questionnaire contains 49 questions in total. Of these, 34 are multiple-choice or open quantifiable questions that are scored.
- **Completing existing monitoring with desk research.** The research team conducted additional research notably on the different national portals in order to assess the availability of data as well as usability of certain portals.

[13] http://ec.europa.eu/digital-agenda/en/news/public-sector-information-group-main-page

- **Clustering of results, drafting the report and finalising the country fiches.** Building on the previous steps, the results from the countries are summarised in country-specific fiches. In addition, insights are derived at an EU aggregate level for each indicator.

2.2 The details of the Open Data Maturity Scoring

To determine their level of Open Data Maturity, first the countries are scored on Open Data Readiness by looking at the presence of an Open Data policy, the use of Open Data, and the impact of Open Data. All indicators and the maximum scores that can be achieved per indicator are shown in Table 5. The entire scoring method with all 34 sub indicators is shown in Annex I – Detailed scoring.

#	Open Data Readiness Indicator	Number of questions	Maximum Score
1	**Presence of Open Data Policies**	**20**	**500**
1.1	(Open) Data Policy	12	300
1.2	Licensing Norms for PSI re-use	3	70
1.3	Extent of coordination at national level	5	130
2	**Use of Open Data**	**5**	**200**
3	**Impact of Open Data**	**9**	**300**
3.1	Political impact	3	120
3.2	Social impact	2	60
3.3	Economic impact	4	120
	Total	**34**	**1000**

Table 5 - Scoring of indicators Open Data Readiness

The scoring of each indicator is based on the importance of the subject and the number of questions that is included. The public sector is responsible for the initiation of the Open Data programme by setting rules and regulations, developing a national portal, organizing events to promote the data release, and creating awareness. For this reason, the landscaping analysis is conducted from the perspective of the public sector, responsible for the set-up of both the policy and portal supporting Open Data.

When considering the **Open Data Readiness** indicator, the presence of an Open Data policy forms the basis for a successful Open Data journey. Therefore, it should represent half of the total maximum score for this specific indicator. The next important step, after the laws and regulations are in place, is the efficient stimulation of the re-use of Open Data. The number of visitors gives insight into a successful initiative duly communicated to citizens and businesses. Thus, a higher number of re-users results in a higher score. The awareness of the existence of publicly available data increases when more citizens and businesses use Open Data and make it common knowledge. The last step is measuring the impact of the re-use. One of the major reasons to release Open Data is to stimulate the economy. However, the public sector itself benefits from easy access to their data as well. Open Data enables better decision making in politics and increases transparency, making it of equal importance as the economic impact. The social impact scored lower as it is more difficult to assess and includes only two questions.

Three additional sub indicators from the second part of the Open Data Maturity Assessment assess the **Portal Maturity**. To determine the Portal Maturity, twelve questions are answered by going

through the national Open Data portals. The maximum scores that can be obtained are shown in Table 6. Countries that do not have a national Open Data portal score zero points here.

#	Portal Maturity Indicator	Number of questions	Maximum Score
4	Usability of the portal	5	100
5	Re-usability of the portal	3	100
6	Spread of data across domains	4	50
	Total	12	250

Table 6 - Scoring of indicators Portal Maturity

The usability of the Portal is important as it indicates how easy users can find the data they are looking for. More advanced features score higher, for example, whether a feedback mechanism is available to comment on the quality of the data set. The re-usability focuses on the type of download available. The percentage used for this indicator is derived from the Open Data Monitor. The last indicator shows the choice of data sets and their spread across domains. A mature portal includes numerous data sets covering multiple domains from various public bodies. The reason to score this indicator with fewer points than the other two is that the spread of data sets is not essential for the user experience. In addition, the number of data sets depends on the size of the country.

Since it is not possible to give a score to an unanswered question, the results per question do not include the countries that did not answer. Therefore, some percentages showing the answers to a question include a higher sample of countries than other questions do. Nevertheless, the average number of countries that answered to a question is 26.

In addition to the present report, country fiches depicting the specific situation of each country are drafted. Country fiches contain further information with regard to the impact, best practices and main barriers faced for further publication of data and its re-use. For the sake of offering a safe learning environment to European countries, the country fiches remain restricted. This report includes the main findings though.

3. The current state of play

In many countries the Open Government Data initiative has been picking up pace in recent years. Open Data witnesses an increase in political support. This trend is confirmed in the 2015 landscaping conducted for the EU28+. This chapter will explore the main trends in terms of Open Data Readiness and Portal Maturity.

3.1 Open Data Readiness

Open Data Readiness indicates in which way countries have integrated Open Data policies and licensing norms. It also looks at the extent of coordination at national level when it comes to Open Data guidelines, setting common approaches, and transposing the revised PSI directive. Furthermore, the use of Open Data and the impact of Open Data are discussed. Finally, an overview of the state of Open Data Readiness in the EU28+ is given.

3.1.1. Presence of Open Data policies

In the EU28+, the presence of Open Data policies witnesses an overall level of 57.4%. In total, 22 countries have indicated that they have a dedicated Open Data policy. In addition, licensing norms are quite developed, as the EU28+ countries score 72.9%. However, national coordination in the field of providing guidance to local or domain specific areas is lagging behind.

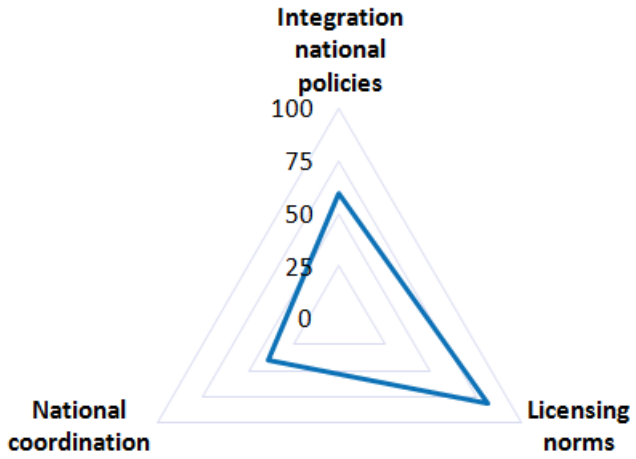
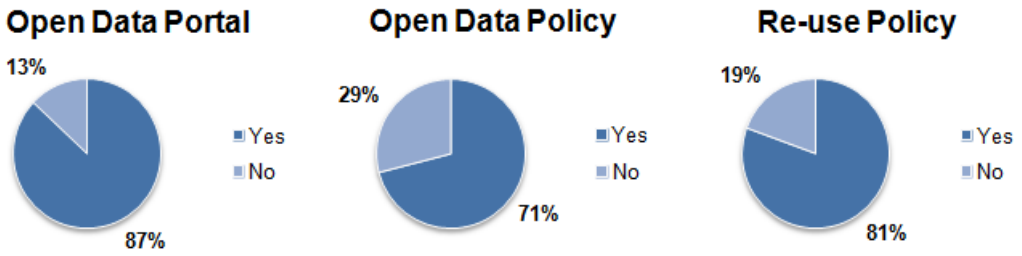


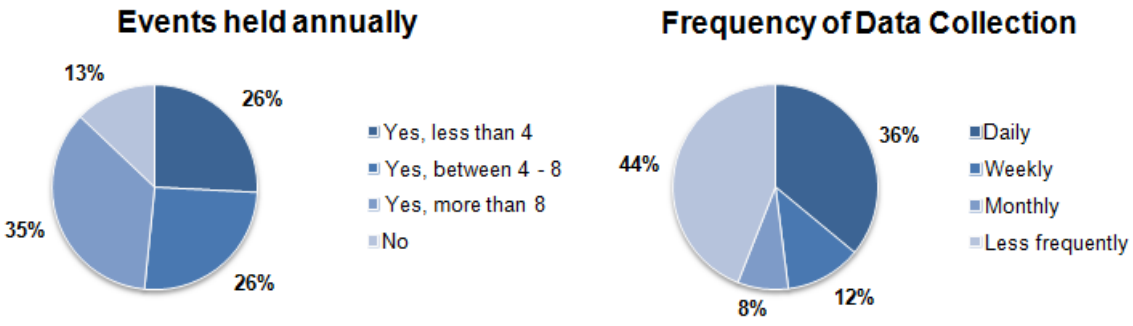
Figure 5 - EU 28+ average of Presence of Open Data policies

The first sub indicator of Open Data is the integration of national Open Data policies. Of the EU 28+ countries, 87% already has a national Open Data portal. However, not all countries have an Open Data policy in place. Only 71% of the countries have created and approved an Open Data policy. The Open Data policy is often part of a more generic Digital Strategy or eGovernment programme with a specific section dedicated to Open Data. The countries without an Open Data policy have a Freedom of Information Act or eGovernment strategy, but a standalone Open Data policy is not part of that yet. In 45% of the countries, the Open Data policy is the same as the Public Sector Information policy. Although not all countries have an Open Data policy, most of them do have specific policies supporting the re-use of Open Data. In total, 81% of the countries have such policies.



With regard to the Open Data policies, the number of events organized around Open Data and the frequency of Data collection were also assessed. The public bodies in a few countries organize training sessions and conferences dedicated to Open Data. In addition, there are some public-private initiatives to promote the re-use of Open Data. A well-known example is the organisation of hackathons. Those events focus on specific data domains or data sets released by a private or public organisation. 35% of the EU28+ countries organize Open Data events more than eight times a year. This trend is in line with the ePSI scoreboard measurements indicating that nine of the EU28+ countries have organised up to twelve events per annum. However, 13% of countries indicate that they do not organize any kind of event – four of the EU28+ countries do not seem to be organising any events, as confirmed again by the ePSI scoreboard.[14]

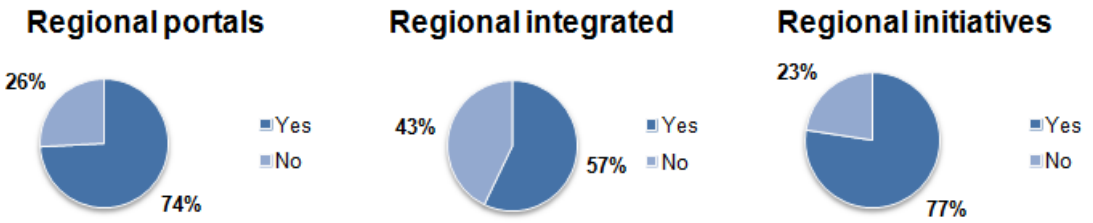
Another notable result is that only 35% of the countries collect data from the relevant public sector data holders on a daily basis. Almost half of the countries (44%) collect data less than once a month. To stimulate the re-use of Open Data, the availability of real-time or recent data is of great importance. A standardized approach to ensure the data is up-to-date is often lacking. In many countries, every department decides on their own approach, making it difficult for users to depend on the availability of the most recent data.



The second sub indicator looks at the extent of coordination at the national level. Besides the national portal, the public bodies of the EU28+ countries have often created regional and/or local portals. In 74% of the countries, regional and/or local portals exist. All countries that do not have a national Open Data portal do have regional and/or local portals. The majority of portals include a dedicated portal of the capital city. Next to this, also some regions and government departments maintain a dedicated portal. These regional and/or local portals can be integrated into the national portal. However, only in 57% of the countries the regional and/or local portals are integrated in the national Open Data portal. One reason for this lower percentage is the decentralization of

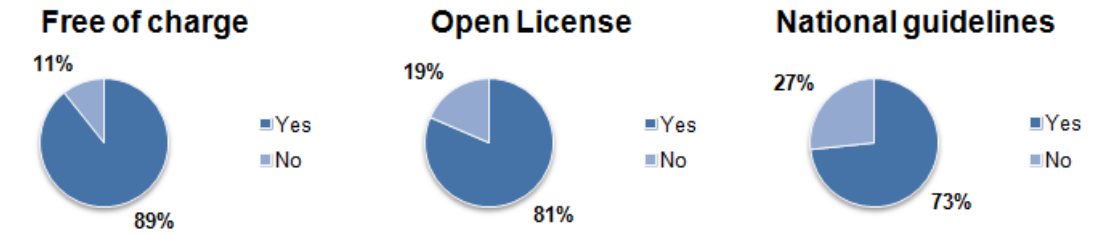
[14] https://docs.google.com/spreadsheets/d/1P3jXcDgFQml4e8MKdvcq9Gzii-BmKf5fo0XCpr4Wmf8/edit#gid=0

geographical departments in the countries. In 77% of the countries, departments run their own Open Data initiatives. Furthermore, according to the ePSI Scoreboard, at least twelve European countries do not have local Open Data activities in the likes of two entities on the local level (cities, municipalities, provinces), publishing at least ten datasets each.[15]



Another important sub indicator is the use of the right licensing norms enabling the re-use of Open Data. If a portal is available, the data on it is available free of charge in 89% of the EU28+ countries. In addition, not all portals offer the data under a standard open license. 19% of the countries do not do so. One reason is that in many cases the use of an open license has been approved, but is not implemented yet. Another reason is that multiple licenses are recommended, but the use of a standard license is not encouraged. Luckily, most countries (81%) indicate that they use a Creative Commons license or their own version based on that license. However, when looking at the details collected by the Open Data Monitor when crawling up to 133 portals across Europe, only 46% of the data sets contained an open license. This indicates that the practice needs to keep pace with the political action plans elaborated at national level.

Countries could become more active in promoting free of charge policies and open licenses. According to the ePSI Scoreboard, eleven of the EU28+ countries still have a national government policy that officially supports a PSI-pricing mechanism based on a cost-recovery model. Our research shows 27% of the countries do not have national guidelines on the publication of Public Sector Information. Only 66% have a national data policy providing for a standard license (or suite of licenses) encouraging public sector bodies to avail themselves of when allowing PSI re-use.



In 2013, the PSI Directive, establishing a common legal framework for a European market for government-held data (in place from 2003), was revised. The revised Directive placed attention on the introduction of a margin-oriented fee, increased transparency regarding calculation of the fees, and reinforced support to the establishment of Open Data portals. Thirteen Member States have transposed – entirely or for the most part – the revised PSI Directive. Nine other countries expect the transposition completed before the end of 2015.

[15] ePSI Scoreboard Indicator: two entities on the local level (cities, municipalities, provinces) are publishing at least 10 datasets each (which are updated at least annually), and foster Open Data Groups that are publicized

3.1.2. Use of Open Data

The use of Open Data is strongly fostered by the presence of a national Open Data portal. 87% of EU28+ countries have a national portal. Only four countries do not have a national portal yet, namely Latvia, Liechtenstein, Luxembourg and Malta. Nevertheless, in those countries there are other websites supplying Open Data. Latvia is still developing a national portal, but some governmental institutions publish data on their own websites. The same is true for Liechtenstein, where some other portals already exist. Luxembourg now only provides data on a specific geospatial data portal, but the national portal will launch in 2016. Malta was part of the HOMER project[16] that included a portal as well, but the project has ended and does not support the portal anymore.

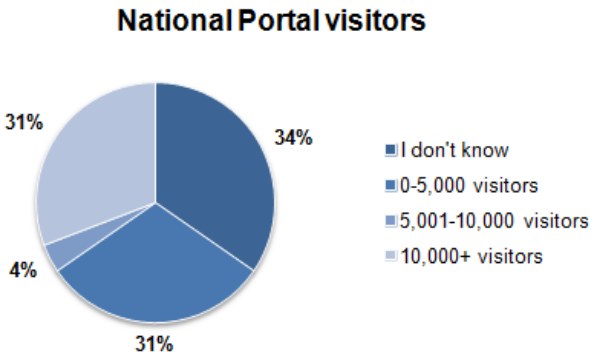


Figure 6 - EU28+ average number of visitors

Having a national portal does not necessarily mean that Open Data is being used, while not having a national portal does not mean that Open Data is not available. Therefore, one should look at the portal statistics. Seventeen countries provide the average number of unique visitors per month, as Figure 6 shows. The number of visitors range between 200 and 175,400 visitors a month. On average, the EU28+ countries receive 22,971 visitors a month. Eight countries receive 10,000 or more visitors on their national portal, as Figure 7 shows.

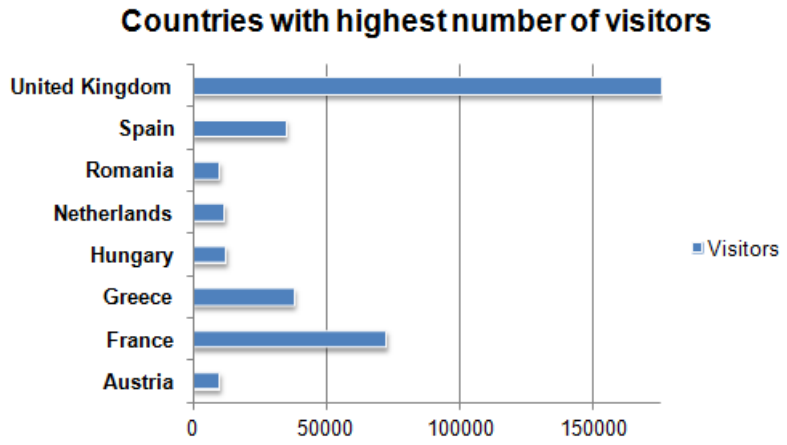
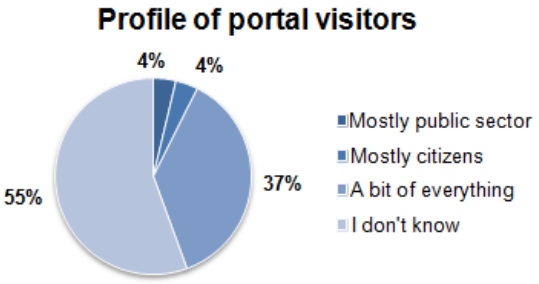


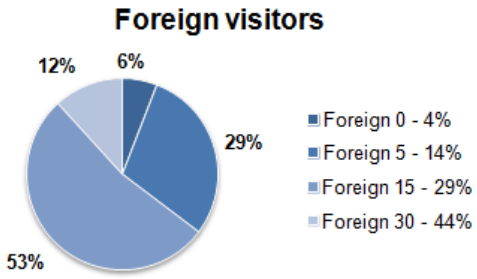
Figure 7 - EU28+ countries with over 10,000 visitors per month

The typical profile of visitors from the portals is difficult to decipher since 56% of the countries lack information about the typical profile of the visitors. However, most countries describe the visitor type as a mix of citizens, business, and other administrations, without a clear dominant group. What is known about the visitors is that the portals do not just attract visitors from within their own country. Several countries indicated that they receive visitors from foreign countries on their national portal, counting for up to 44% of the total number of visitors. Half of the EU28+ countries indicate that between 15 and 29% of their visitors is foreign. Unclear about the portals is how much of the traffic is generated by humans as opposed to traffic generated via API access. 77% of countries have

[16] HOMER: Harmonising Open Data in the Mediterranean through Better Access and Re-use of Public Sector Information. Strategic project with the focus on Open Data in Spain, Italy, France, Malta, Greece, Slovenia, Cyprus and Montenegro.

made their national portals machine accessible with an API. However, of these countries only 35% indicate the proportion of traffic generated by machines.





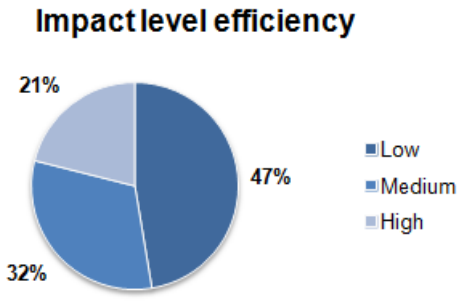
On average, the countries score 72 out of 200 points on the use of Open Data. The scores range from zero to 165 points. The difference within the EU28+ is large. Several EU28+ countries already receive more than 10,000 visitors per month, but several countries have no insight at all into the use of their data and thus score zero points. One question remains: what is done with the data? What impact does Open Data generate?

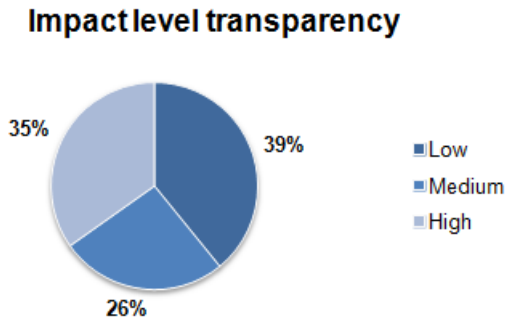
3.1.3. Impact of Open Data

As countries develop Open Data policies, further understanding and measuring of the impact of Open Data becomes necessary. However, most of the EU28+ countries have difficulty assessing the impact of Open Data in their country. Some effects of the release of Open Data are visible, but an estimation of the impact due to the release of data remains a challenge to identify precisely. The main impacts recorded are political, social and economic.

Political impact

Only 47% of countries indicated that Open Data had a low impact on government efficiency and effectiveness, whereas a third of them considered it being moderate. Solely one fifth thought the impact on efficiency was high. Regarding the impact of transparency, the responses are more even: 35% consider the impact high, 26% medium and 39% low as depicted in the charts below.





In Bulgaria, the release of Open Data led to increased administration accountability, improved mechanisms for providing public information for re-use in an open format, and an increase in the use of public data by citizens and businesses. However, it was the only country that actually described a decreased governmental efficiency, because the allocation of additional resources was needed in order to transform and publish data. Nevertheless, those effects should diminish on the longer term.

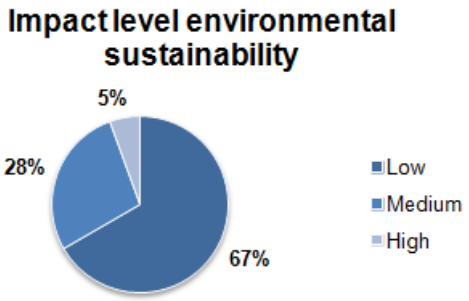
In one of the biggest countries in Europe, the main impact of Open Data is political support. The central government granted budget to deploy strategies and projects that have an impact on government efficiency and effectiveness. The results are simplified data production and analysis through task duplication avoidance, effort capitalisation and communication improvement. Public administrations were the first users of the released data and thereby contributed to the success.

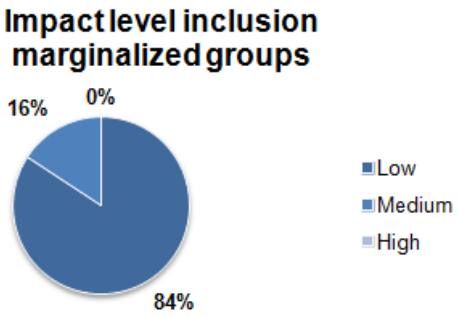
Several countries indicated that Open Data has a high impact on government transparency and accountability. The release of government budget data increases the control citizens have on the spending behaviour of their politicians. In one country, this led to the resignation of a Minister after her extra earnings – besides her job as a politician – were publicly accessible. Another example of transparency improvement is the release of medical trial data. This provides better insight in the performance of medicines. The countries that answered that the impact of Open Data on transparency is low had two different reasons: it is still too early to make any claims about the impact or, on the contrary, all information was already available long before the introduction of Open Data, thus does not result into new impact.

Social impact

The estimation of the social impact of Open Data remains at an early stage, as countries progressively implement their Open Data policies and related portals. One of the countries has enough evidence on the usefulness of Open Data influencing environmental sustainability. Their national Open Data portal includes 223 environmental data sets. Third parties integrated the available Ozone (O3) data in seven different applications. One of the most impactful actions related to the environment in another country is the Climate Change Challenge (C3) which is an event inspired by hackathons. It focuses on fostering the co-creation of innovative solutions to climate change, raising awareness on climate change, structuring a dialogue between the actors involved in climate change, and experiencing new methods of Open Data. Another example is a free software web application created to search, analyze, and compare forest fires that took place during the last decade, including its magnitude, location, causes, and consequences. These few examples highlight the potential of Open Data to influence the environment in a positive way. However, the number of countries with no expected impact of Open Data on the environment was 67%, which indicates that there is room for improvement.

For the time being, Open Data is not considered as having a high impact on the inclusion of marginalized groups in any country. Only one country was able to explain how Open Data has some positive effect on certain groups. The groups that are more involved in government services are data scientists, hackers, and engaged civil society. Participation of socially marginalized groups is limited due to a lack of culture and skills to work with data effectively. However, the development of a tool helps citizens with their social benefits' requests. After answering a short questionnaire, it provides an overview with all social benefits that are applicable to you and direct links to access the application process. Similar tools exist that help all citizens in their day-to-day life, but do not particularly focus on specific minority groups.



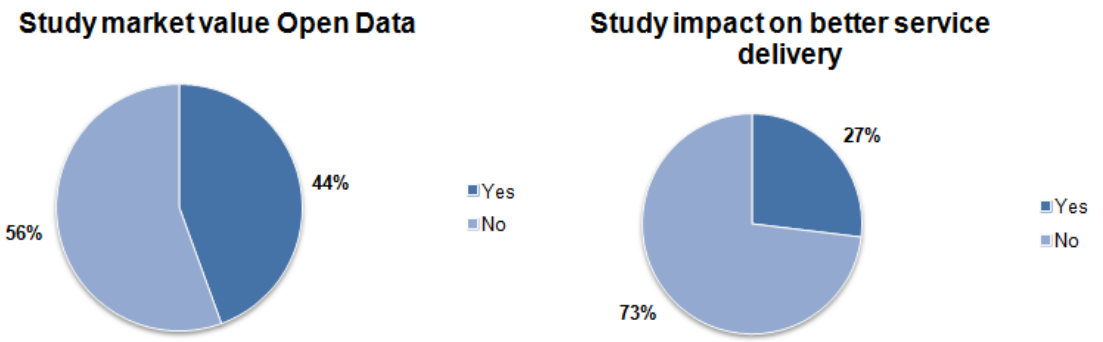


Economic impact

One of the benefits that the use of Open Data yields is economic value. Open Data can create economic value in different ways. Value can be realised in market transactions in the form of revenues. Moreover, jobs are created by producing a service or product based on Open Data. Finally, Open Data can lead to cost savings and efficiency gains. The expected economic gains are detailed in the study 'Creating value through Open Data: Study on the impact of Re-use of Public Data Resources'.[17]

So far, not many studies have been performed measuring the economic impact in the EU28+ countries. Twelve countries indicated in the questionnaire that they know of the existence of macro-economic studies in their country. Most of these countries performed an assessment of the potential benefits before they initiated an Open Data programme. However, most benefits presented remain at a qualitative level. Some studies assess the service delivery of the government. Those studies focus on eGovernment and public services available via the internet. Some of the aspects link back to Open Data, but the focus is not primarily on the impact of Open Data. More countries provide information about general studies done regarding Open Data without a specific focus on quantifying the economic benefits. For example, the potential re-usability of a specific data set was studied in one country. Another country-specific study looked at the socio-economic potential of combining Open Data with other data sets. A more extensive country-specific study includes the entire Open Data sector with many different aspects. The study looks at both the economic value of Open Data and the number of jobs created. Another country provided an example in which it eliminated the number of address data duplicates, thanks to the creation of one central data set including all data. It allows civil servants to adjust errors and omissions more easily by adjusting only this main data set. This is an example of an achieved efficiency gain. In general, national studies describe the current situation of Open Data in the country and the activities organized to improve.

[17] European Union, 2015. Creating Value through Open Data.



When it comes to the economic impact of Open Data, the costs of opening up PSI are often discussed. At what price should the data be available? Who should cover the costs: the re-users or the government? Research has shown that the price elasticity of demand for Open Data is high: public sector agencies in various countries have witnessed a strong growth in demand for information they provide after switching from cost-based pricing of Open Data to free or maximum marginal cost priced information.[18] The revised PSI Directive also prescribes the general decrease in charges in the direction of a marginal cost model. The questionnaire showed that, out of the eighteen countries that answered this question, all confirmed they have implemented a marginal cost model to charge for Open Data.

Overview of impact indicators

Most of the EU28+ countries had difficulty assessing the impact of Open Data in their country. Although for every country an estimation of the impact thanks to the release of data was challenging to identify, based on the questionnaire an overall estimation can be made around the political, social and economic impact of Open Data in the EU28+ countries.

If the maximum points that could be scored per impact indicator are compared to the scores given by the countries, it shows that the impact of Open Data is far from reaching its potential. On average, only 88 out of 300 points are scored. However, the scores range from zero to 240 points. On all three factors, not even half of the impact is reached, as Figure 8 shows. Most impact is obtained on the economical level where the average score is 38.3%. On the social level, the impact is very small with only 8.3%. The political impact reached is 30.8%. This shows a clear need to provide support activities to the EU28+ countries. The countries need to move forward in assessing the benefits reaped from developing Open Data policies and portals.

[18] Koski, H. (2011), *'Does Marginal Cost Pricing of Public Sector Information Spur Firm Growth?'*, p. 6. Helsinki: Etla, the Research Institute of the FinnishEconomy. Online available at: https://www.etla.fi/wp-content/uploads/2012/09/dp1260.pdf

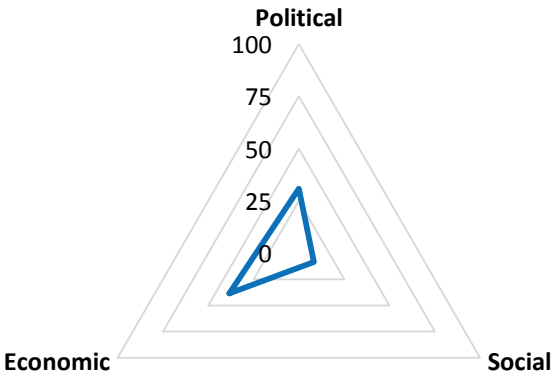


Figure 8 - EU 28+ average of political, social and economic impact

3.1.4. Overview of Open Data Readiness

Based on all the Open Data Readiness sub indicators discussed, a comparison can be made between the EU28+ countries. On average, the EU28+ countries score 447 points out of a maximum of 1000. The scores range from 20 to 830 points.

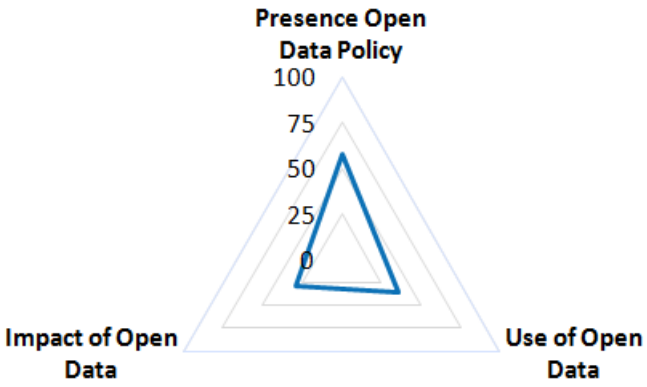


Figure 9 - EU28+ average of Open Data Readiness

Clearly, the EU28+ countries are not evenly ready for Open Data. Some do not yet have an Open Data Portal. Others already publish data in open formats and free of charge. Five Open Data Readiness categories have been recognized, as can be seen in Table 7 - Open Data Readiness categories. The number of countries per category is shown in

Figure 10.

Category	Open Data Readiness points
Not ready	0-200

Partly ready	201-400
Almost ready	401-600
Ready	601-800
Very ready	801-1000

Table 7 - Open Data Readiness categories

Countries that are not ready for Open Data score less than 200 points. These countries do not have an Open Data portal in place yet. They do not yet have the right policies and licensing norms in place. The same applies to countries that are partly ready. All of these countries need a combination of common support material and training as well as targeted support to continue their Open Data journey. Most of the EU28+ countries are almost ready for Open Data. The basics are set and guidelines towards Open Data exist. Only seven countries are (very) ready for Open Data. These countries will probably only need coaching assistance. Further specialised training can be offered to these countries, especially to the ones that are very ready for Open Data.

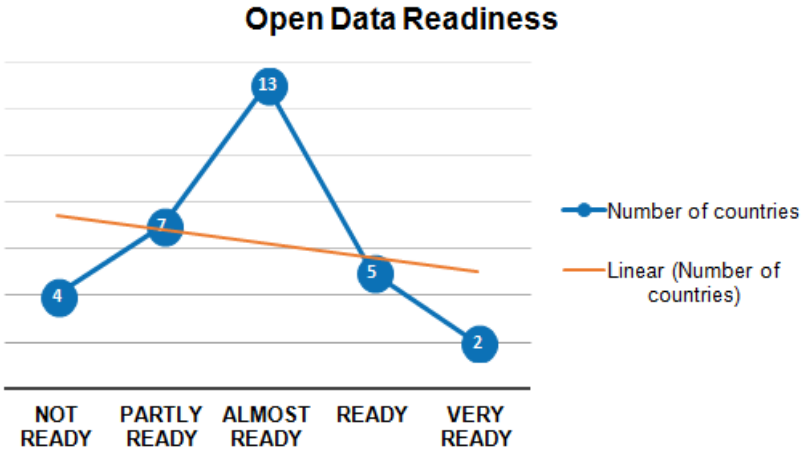


Figure 10 - Open Data Readiness

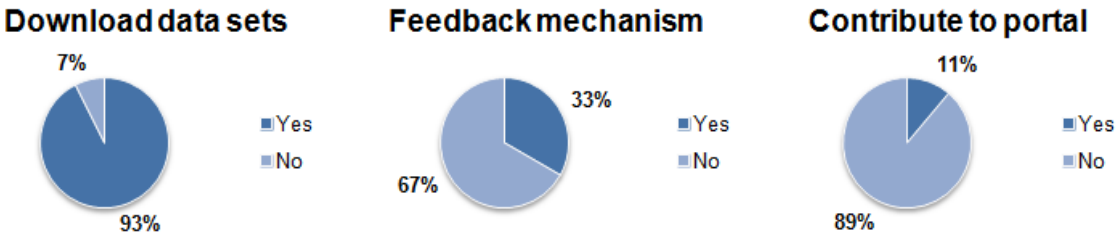
3.2 Portal Maturity

The second key indicator of the present landscaping is Portal Maturity. As 87% of the EU28+ countries have a portal, this is an important first step. Value comes also from assessing what is available on that portal in terms of data sets, formats, feedback functionalities and so on. Together this constitutes Portal Maturity.

3.2.1. Usability of the portal

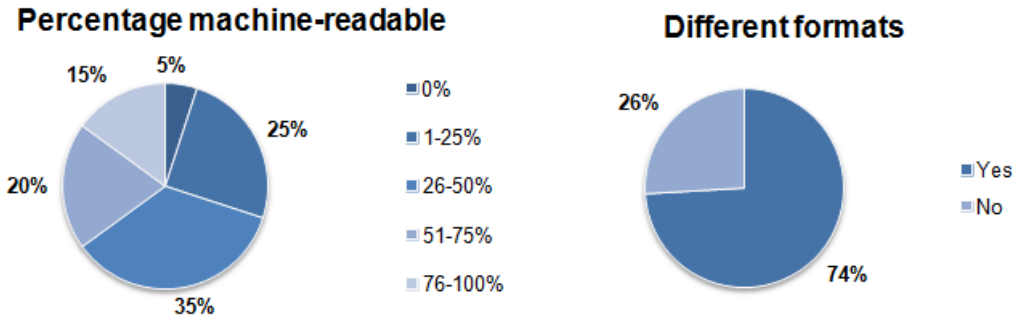
The usability of the portal is important as it indicates how easily users can find the data they are looking for. More advanced features score higher. There is a large difference in the advanced features supported by the EU28+ countries. However, all but one portal support the main feature of the portal; the ability to search for data sets. 93% of the portals allow visitors to download data sets. However, only 33% of the portals support feedback mechanisms for users to give their opinion on

the service and/or the data. The possibility to contribute to data sets is hardly offered to portal users. 11% of the EU28+ countries offer this feature on their portal.



3.2.2. Re-usability of data

The re-usability focuses on the type of formats available for downloading data sets. It is preferred to make all data sets available in a machine-readable format, as these can be accessed in an automated fashion. The Open Data Monitor[19] has identified which percentage of the data sets is machine-readable. Their insights were used to determine the score for the EU28+ countries. According to the Open Data Monitor, 35% of the countries provide over 50% of the data as machine-readable content. In another 35% of the EU28+countries, 26 to 50% of the data sets are machine-readable. Furthermore, according to the ePSI Scoreboard, nine of the EU28+ countries do not have a national data catalogue available in machine-readable formats. Only four European countries officially support Linked Data. Furthermore, the possibility to download data sets in bulk was determined. However, not a single country offered this feature for downloading. The possibility to download data sets in different file formats is supported more broadly. 74% of the EU28+ countries offer this feature.



According to the web crawling done by the Open Data Monitor of 133 catalogues, 56% of the data formats available were not proprietary. Finally, having comprehensive metadata for each data set is key for discovering the data. Nonetheless, only 59% of the data sets assessed by the Open Data Monitor had complete core metadata.

3.2.3. Spread of data

The last indicator of the Portal Maturity shows the choice of data sets and their spread across domains. A comprehensive portal includes numerous data sets covering multiple domains from various governmental institutions. Figures about the use of the data can be divided into two

[19] http://project.opendatamonitor.eu/

categories: data domains and data sets. A data set is a single set with specific data, for example, the postal codes in Italy. A data domain is a categorization from data sets, mostly defined from either a government perspective (according to a department) or user perspective (according to the characteristics of the product or service). For example, the geospatial data domain would hold the data set with Italian postal codes. Additional domains are company information, crime and justice, earth observation, education, energy and environment, finance, geospatial, global development, government accountability and democracy, health, science and research, statistics, social mobility and welfare, transport and infrastructure. For a broader description of these domains, taken from the G8 Open Data Charter,[20] Annex II – Domains listed in the G8 Open Data Charter presents a description. The EU28+ countries were asked to indicate which of the fourteen data domains are most often consulted on their portals. Figure 11 captures these findings. High priority domains, as identified by the European Commission in the Guidelines to the Revised PSI Directive[21], appear in yellow.

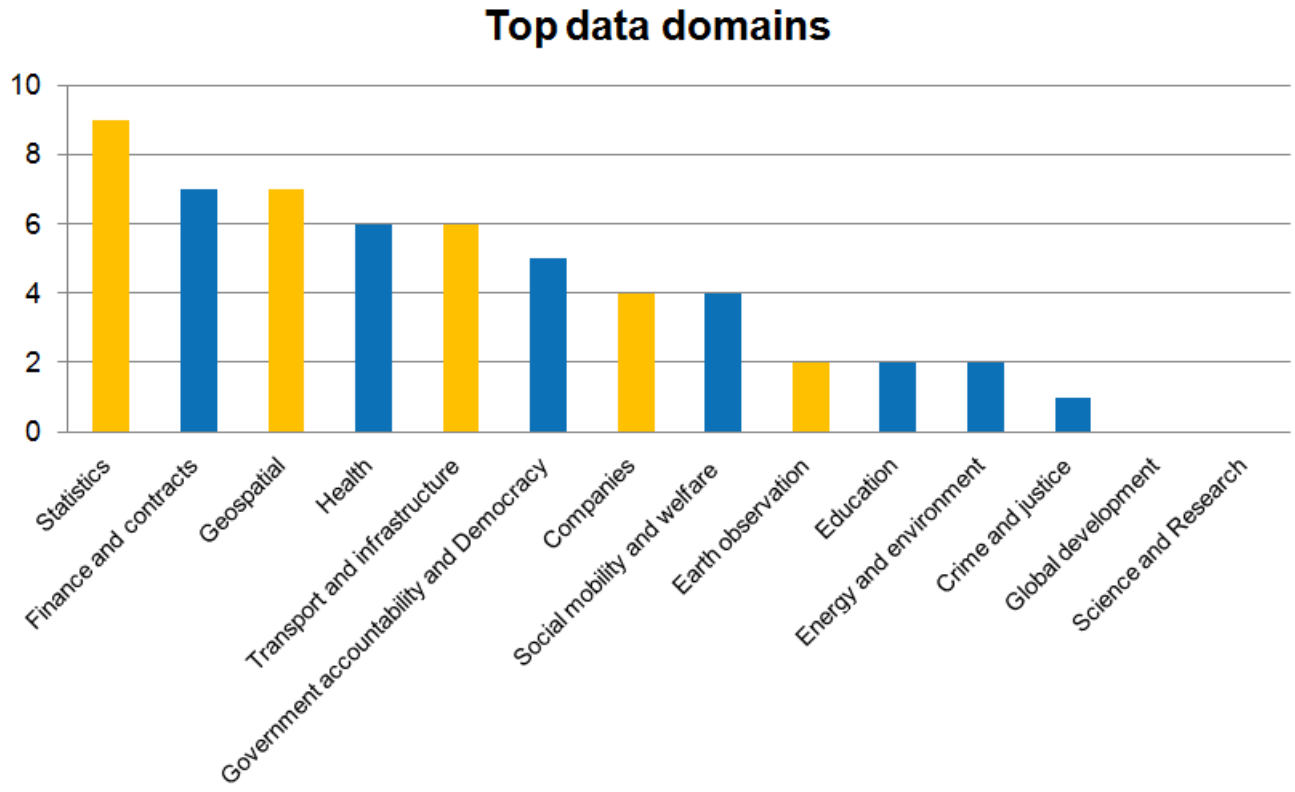


Figure 11 - Top data domains consulted by the EU28+ countries. High priority data domains appear in yellow

The most consulted domains as indicated by the EU28+ countries overlap with the five data domains that the European Commission has identified. The Commission states that geospatial data, earth observation and environmental data, transport data, statistical data and selected company data are high priority data domains. These domains appear in yellow in Figure 11. Statistics are indeed included as a top data domain by nine countries. Geospatial (seven countries) and transport (six countries) data are in the top five of the EU 28+ countries. However, earth observation and company data are not that often consulted according to the results from the questionnaire.

[20] https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/207772/Open_Data_Charter.pdf
[21] https://ec.europa.eu/digital-agenda/en/news/commission-notice-guidelines-recommended-standard-licences-datasets-and-charging-re-use

Several of the EU28+ countries shared information about their most downloaded data sets as well. However, the type of data set that is most popular differs highly between countries. This has several reasons. Obviously, there is a difference in the kind of data that is released per country. Therefore, popular data sets in some countries are not published in other countries. In addition, the data sets are not always comparable. For example, the most downloaded data set in Spain is 'Health Information and Statistics of the Autonomous Communities' which is somehow comparable to the 'Number of patients by every Primary Health Care Practice', the most downloaded data set in Croatia. Furthermore, interest per countries seems to differ highly. The citizens in Greece, on the one hand, are most interested in the 'Fuel prices', whereas in France the 'Official postal code database' is most popular.

3.2.4. Overview of Portal Maturity

The maturity of the Open Data portals is a key indicator of the Open Data Maturity Assessment. Portal Maturity looks at the usability and the re-usability of the portal, as well as the spread of data across domains. In total, 250 points can be scored on portal maturity. On average, only 104 points were scored, with a range of zero to 190 points. The countries that scored zero points are the countries that do not have an Open Data portal. If the scores for these countries are not taken into account, the average score increases slightly, to 119 points. The least mature portal scores only 10 points. Overall, the EU28+ countries score 50% on usability, 33% on re-usability, and 42% on the spread of data across domains, as shown in

Figure 12. These percentages show clear paths for improvements.

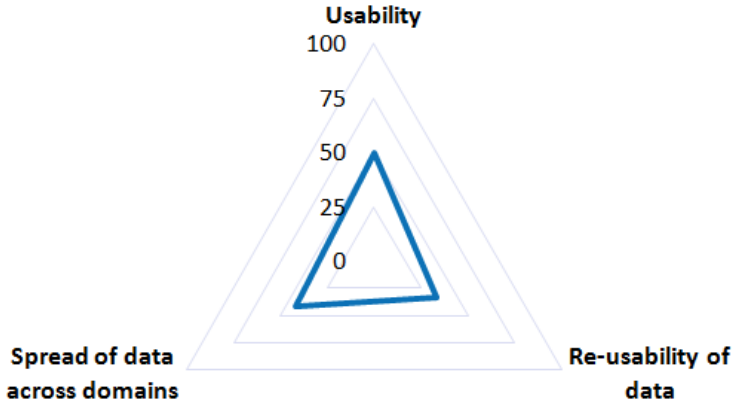


Figure 12 - EU28+ average on Portal Maturity

3.3 Open Data Maturity

Within the Open Data Maturity Assessment, a maximum number of points were distributed. The maximum score of the Open Data Maturity Assessment is 1250 points. If a country scores 1250 points, this would indicate that the Open Data journey is completed at 100%: the country has reached full Open Data Maturity. However, based on the monitoring activities conducted by different projects and the present landscaping, not a single country has yet been identified that has reached full maturity.

The scores range from 20 to 1020 points. On average, 551 points were scored. On Open Data Readiness, the average score was 447 points. On Portal Maturity, the average score was 104. Since it was not possible to give a score to an unanswered question, any unanswered question resulted in a score of zero for that question. This lowered the scores. However, the average number of countries that answered to a question is high, with 26 out of 30 countries that have answered the questionnaire.

Based on these results, European countries can be clustered roughly into three different levels of Open Data Maturity:

Beginners: the initial steps have been made but they are still struggling with basics around availability, accessibility, portal functionalities remain limited and there is a limited coverage in terms of data sets.

Followers: the basics are set, including a clear vision and there are advanced features on the portal, however the approach to the release of data is very much in silo and remains limited.

Leaders – Trend Setters: these are the most advanced and have solid Open Data portals with elaborate functionalities and coordination mechanisms across domains.

Plotting the scores of the countries into the maturity graph on the next page, shows that seven of the EU28+ countries are considered as Beginners. Most of the countries are considered to be Followers. Fourteen countries are classified as Followers. Only ten countries are considered as Trend Setters.

Europe benefits from a high level of Open Data Maturity with a large majority of countries where the basics have been set and portals launched. In addition, many of the "Beginner" countries are in the process of launching further structured initiatives around Open Data. Over the summer of 2015, Luxembourg launched its Open Data Strategy and aims at developing its first national portal in the beginning of 2016. Other countries such as Lithuania are developing an API to make their national portal accessible by machines.

Nonetheless, many European countries are "Followers," pointing to the fact that they have moved forward with their political agendas and portals. What is critical now is to move further forward and accelerate the publication of data sets as well as providing more guidance to the sub-national level. This is necessary to ensure interoperability as well as ease the harvesting of local portals to increase the discoverability of data. Key is also ensuring that data sets are up to date and harvested on a frequent basis. The research conducted shows that there is a lot of progress to be achieved in ensuring more frequent harvesting of governmental sources.

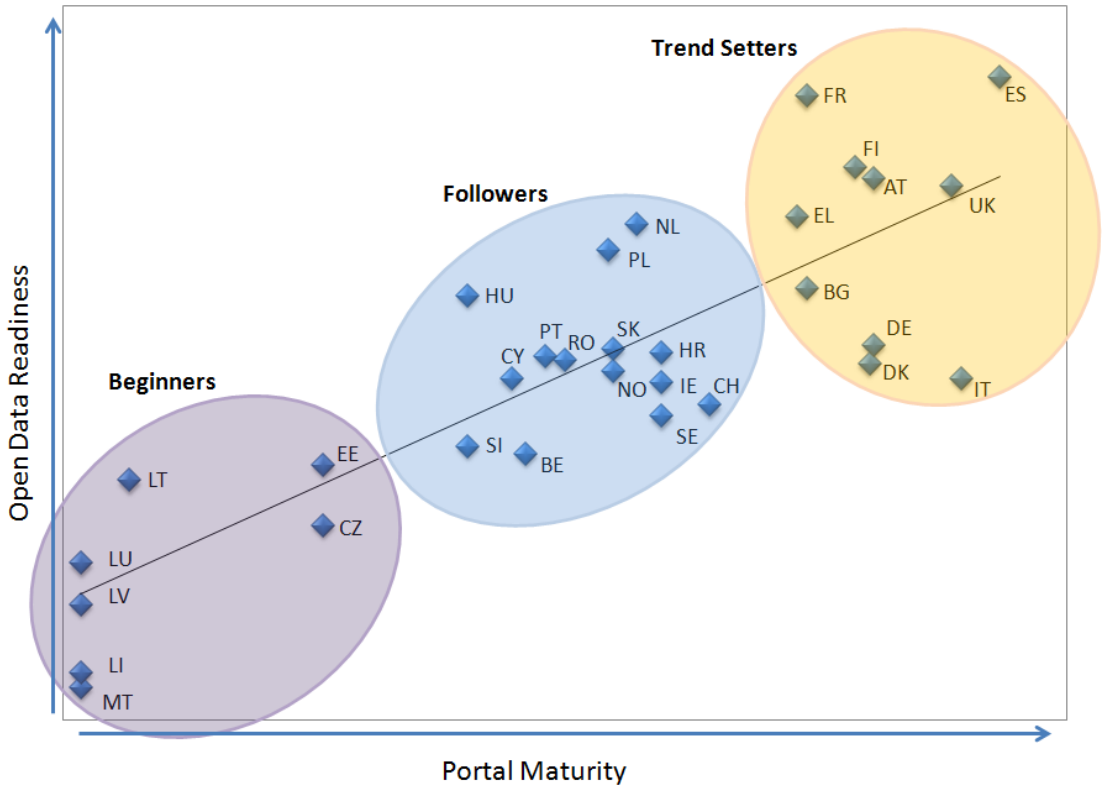


Figure 13 - Results from Open Data Maturity Assessment for the EU28+ countries, 2015

In essence, the landscaping has shown that, when comparing different measurements, a gap remains between the ambition and guidelines set forward, and the reality of what is witnessed when assessing countries' Open Data portal. Luckily, these gaps remain minor, as can be seen when exploring the different measurements assessing licensing for instance, or the machine accessibility of portals. Our conclusions indeed highlight gaps that are mainly due to the time-lapse between implementation and the plans elaborated. Nonetheless, as European countries develop their portals, they need to develop more user-friendly functionalities and ensure their portals are systematically accessible via API.

The next chapter will explore the different barriers reported by the countries as they strive to develop and implement their Open Data policies.

4. Barriers remain in reaching full Open Data maturity

The previous chapter has shown that the EU28+ countries are progressing on their Open Data journey. However, they have not reached the full potential yet. Several barriers have been identified that can shed light on the bottlenecks the countries are facing. Those barriers are negatively influencing the further publication of data by the government as well as the stimulation of the re-use of Open Data. This chapter addresses political, legal, technical, and financial barriers. Furthermore, the lack of awareness around Open Data and the relative small amount of data released by some countries can be barriers in reaching Open Data maturity.

4.1 Political

A few different political barriers exist in the European countries. The responsibility for the Open Data policy is not clear in some countries or scattered across several departments, making it difficult to adopt a national Open Data policy. Better coordination between the different public sector bodies is needed to promote the publication of Open Data. In some countries, the culture to share and collaborate between different departments is lacking. In addition, more than one country indicated that the Open Data policy is not high enough on the political agenda. Civil servants see Open Data as a 'nice thing to have' instead of a requirement to stimulate the economy. This attitude is hindering the publication of data by public bodies. Another interesting point mentioned is that long running Open Data initiatives check neither effectiveness nor impact. Adjustments could be made after an assessment is done on whether the goals that were set at the start are met thanks to the programme. Positive examples of the impact of Open Data can stimulate the re-use of Open Data.

4.2 Legal

One legal barrier is that a strong legal framework focusing on privacy makes the publication of some data sets difficult. Law inconsistencies make it more difficult to create clear regulations. In some countries, a legal framework that obliges public sector bodies to publish data proactively in machine-readable format is yet to be approved. The more mature countries indicate that they should verify whether the approved Open Data laws are implemented properly. Until these laws are either approved or implemented properly, they form a barrier for the publication of Open Data. A lack of knowledge regarding the content of the legal framework, including how to operate within it, appears to be a small barrier for public bodies to publicize data. A barrier for the re-use of Open Data is the fact that not all countries offer their data under a standard open license. 19% of the countries do not do so. Sometimes, the use of a standard license is not encouraged. Open Data can only be used to its full potential if it is provided under an open license. The EU28+ countries should become more active in promoting data free of charge and open licensed.

4.3 Technical

The interoperability of the data sources is an important issue in some countries, which needs to be solved before a widespread use is possible. Data is too often not available in open format and the conversion of those data sets takes a huge effort. Furthermore, some countries have technical difficulties to guarantee the quality of data, the monitoring of the quality of data and the updating of data sets, thus increasing the barriers for re-using the data. A few countries indicated a lack of technical employees dedicated to the task of publishing data. On the contrary, citizens lack – or think they lack – the skills to work with Open Data, which creates a barrier for the stimulation of re-use.

Despite the fact that the EU28+ countries indicated in the questionnaire that 76% have made their portals machine accessible with an API, it is not always clear which type of API a portal uses. E.g. standard API such as CKAN or OAI-PMH or use of a proprietary format. Further technical challenges can arise from the incompleteness of the certificate chain for instance, preventing a harvester to connect to the site. This makes it difficult to harvest the portals. In addition, it is not always clear whom to contact with questions around the API of a national portal. This threatens both the publication of Open Data as well as the re-use of it.

4.4 Financial

Multiple countries indicate that financial barriers cause a problem for the further publication of Open Data. Some governmental departments are afraid of the loss of income by making the data available free of charge. They depend on the money earned by selling data, because of how the department is financially structured. Alternative ways to make up for those losses will get this obstacle out of the way. This will also reduce barriers for re-use of Open Data. As mentioned previously, the price elasticity of demand for Open Data is high. Switching from cost-based pricing to a Marginal (Zero) Cost Model results in a strong growth in the demand for Open Data.[22] The revised PSI Directive also prescribes that governments use in general a marginal cost model for calculating the charges.

Another important financial barrier for publishing Open Data is that the initial initiative to stimulate the release of Open Data costs money. Some public sector bodies want to start publishing data, but there is no budget to do so. This also affects the re-use of Open Data, since promotion campaigns and the organization of events require extra budget as well, which is not available in every country. One country indicated that further use of data could be stimulated by the introduction of financial incentives. Currently, third parties do not see a reason why they should use Open Data. The explicit demand from the private sector helps to justify public sector efforts to open up data for re-use.

4.5 Other barriers

In addition to the four typical barriers mentioned above, the results from the questionnaire point to the fact that there is little awareness raising activities around the availability of Open Data. Most citizens do not know what Open Data is. This lack of awareness exists in the more mature Open Data countries as well. It is necessary to know which useful data is freely available on the web before people think about re-using it. Next to promoting Open Data in general, specific data sets should be highlighted to increase the further re-use of Open Data. Increasing awareness requires more publications around Open Data. Citizens and businesses do not know the benefits of using Open Data, but that could trigger the interest of more users. In addition, only a few public-private partnerships exist in the field of Open Data. Those partnerships help to start a dialogue and get more involved in the prioritization of the release of data. The demand side is not involved enough in the subject to stimulate the publication of data. The influence of citizens and the private sector could be huge if they would ask for specific data and comment on quality and formats.

Secondly, when assessing the availability of Open Data, the conclusions show that not all public sector bodies are willing to share their information, despite the enormous amount of data held by

[22] Koski, H. (2011), *'Does Marginal Cost Pricing of Public Sector Information Spur Firm Growth?'*, p. 6. Helsinki: Etla, the Research Institute of the Finnish Economy. Online available at: https://www.etla.fi/wp-content/uploads/2012/09/dp1260.pdf

governments. A few pioneer governmental departments publish all available data. Other public sector bodies should be stimulated more to follow that example. Not only is the data quantity important for re-users, but the specific subject of the data sets as well. Key data sets including data of high value are not released yet in multiple cases. The release of those high value data sets could really boost the number of re-users. More coordination between public sector bodies would stimulate better coverage of data fields and topics. Funding of more Open Data projects stimulates the release of Open Data too.

5. Recommendations on how to move forward

The amount of barriers per country differs. For some Beginners, the main barriers still lie with setting up a national Open Data Portal. The Trend Setters might have overcome most of these barriers regarding the publication of data already, but are now facing barriers in increasing re-use. Most of the EU28+ countries have identified their plans to address these barriers in the upcoming years. In doing so, a number of recommendations have been identified.

First, an Open Data strategy is needed. The strategy should state that all data needs an open license, and stimulate the creation of an Open Data policy. It should emphasize the importance of a legal background enabling the release of Open Data and address aspects such as privacy. To ensure the interoperability of the data released, standards should be recommended. The strategy should also focus on stimulating the release of more data sets. Countries should be aware that a strategy is often a five-year plan. Therefore, they should also prioritize the data sets that should be opened. This can be done by taking stock of the data currently available at national level and engaging with re-users of the data. To provide some examples, Switzerland introduced The Open Government Data Strategy for Switzerland 2014 - 2018[23]. The Belgium federal government approved the Digital Belgium strategy[24].

Adding basic functionalities on a portal can stimulate re-use:

- **More interaction is needed with the users**. Engaging with users has many benefits. Feedback mechanisms help the improvement of the quality of the data and metadata. Users can be helpful in pointing out duplicates and broken links for instance. In addition, portals can offer users the possibility to highlight the products and applications they have developed using data. This is an easy way to promote the re-use of Open Data in general. Finally, engaging with users can enable public bodies to collect their needs in terms of data availability. Such a step can help prioritise the release of future data sets.
- **Portals should be systematically accessible via API**. Automated collection of data can take place thanks to this function, which enables using the data more swiftly on a regular basis.
- **Analytics functions should be used more systematically.** This functionality will monitor the traffic on the portal as well as measure which data sets are most searched for and downloaded. It may also shed light on areas where users drop out and pave the way for understanding what to improve to keep the users on the portal.

[23] http://www.egovernment.ch/umsetzung/00881/00883/index.html?lang=en&download=NHzLpZeg7t,lnp6I0NTU042l2Z6ln1ad1IZn4Z2qZpnO2Yuq2Z6gpJCDdYF_fWym162epYbg2c_JjKbNoKSn6A--

[24] http://www.digitalbelgium.be/en#flipbook-reader

Finally, an immediate need for almost all countries is the need to increase awareness around Open Data, including the existence of national and local portals. More information about how to use Open Data should be spread. This can be done by sharing best practices around the re-use of Open Data in the country as well as from other countries. As best practices grow, the benefits of Open Data will also appear more vividly, which in turn creates a virtuous message around Open Data leading to increased re-use. Events can be organized around Open Data, such as hackathons. These can be conducted jointly with seminars and events around eSkills and the overall promotion of ICT. However, Open Data should not be promoted only to the public. It should also be promoted within governments, as governments are in effect one of the biggest re-users of Public Sector Information.

What will also help in reducing the barriers is to offer trainings. Available training material and support should be shared in an easily accessible place. Training can be provided to increase the understanding around Open Data by better defining what it is and what the expected benefits are. To that effect, the European Data Portal has developed a full suite of eLearning modules addressing Open Data[25].

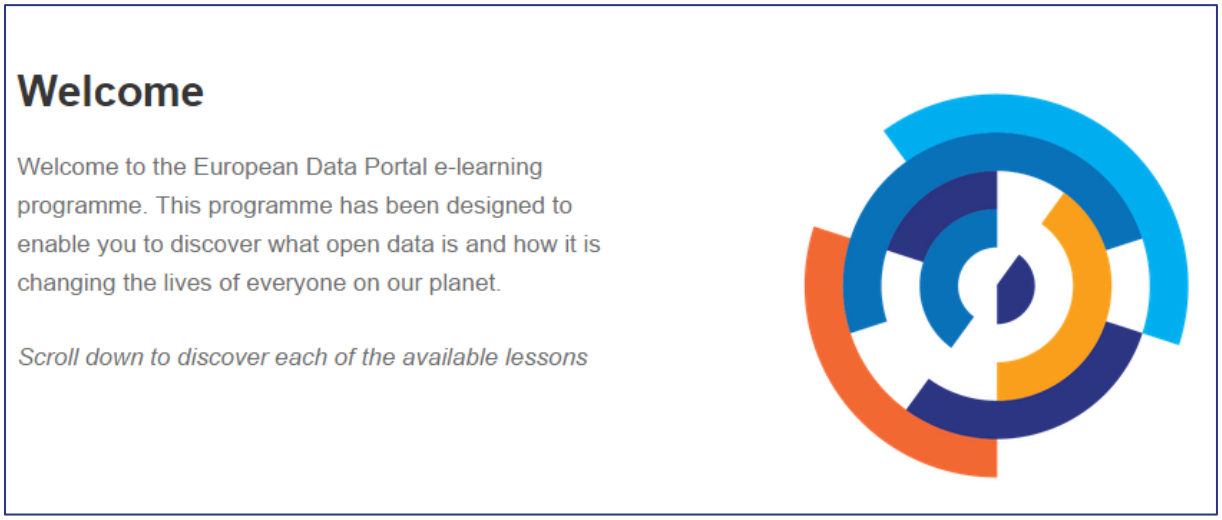


Figure 14 - European Data Portal eLearning Modules

The most important barrier to overcome remains the lack of political will. Having an Open Data Strategy in place is necessary to overcome this barrier. It will set the foundation of the work as well as key roles and responsibilities across government. However, this may not prove to be sufficient. A continuous political foundation is necessary to guarantee cooperation between public sector bodies to create more and better quality data sets together. To achieve this goal, countries should expand their internal support base, creating a network between all public sector bodies. As a result, data could be collected in a systematic way. This should lead to the release of more data on the portal.

Stimulating local actions and offering national guidance regarding licensing, technical standards, and usability can also be a driver for Open Data. More and more initiatives are taking place at local level: more and more cities are developing their own data strategies and data portals. These enable focusing on local data and managing different information scales as opposed to central levels. This multiplies the opportunities for re-use. At the same time, multiple non-coordinated actions pose the

[25] http://europeandataportal.eu/elearning/en/#/id/co-01

question of interoperability. Is data made available in city X regarding parking places available actually interoperable with a similar data set in city Y? Is the data set structured in the same way? Is it in the same format? How often is it updated? These questions matter in order to foster re-use at regional, national, and cross-border levels. Typically, national guidelines could provide part of the answer to these questions, and thereby ensure that Open Data initiatives benefit from a comparable framework when they are launched at local levels.

Measuring the success of current Open Data initiatives is also a means to show what benefits have been achieved thanks to Open Data. To date, very few countries have evaluated their Open Data strategies ex-post. This is mainly because these strategies remain recent and there is too little hindsight to evaluate their impact. However, evaluations can pick up early signals that can be translated to the political level. Measuring the success of an Open Data Initiative can be done by defining a number of Key Performance Indicators that are measurable over time. These can capture key milestones according to the level of development of a country and the developments it foresees.

6. EU candidate countries

In addition to the EU28+, the EU candidate countries Bosnia and Herzegovina, Albania, Serbia, Kosovo, Montenegro and Turkey have also been included in the analysis. This section provides specific insight into the state of play of Open Data in these countries.

There is a substantial difference between the EU28+ and the candidate countries in terms of Open Data Maturity. The EU28+ countries scored 551 points on average, with 447 points for Open Data Readiness and 104 points for Portal Maturity. The candidate countries only score an average of 173 points on Open Data Readiness. Since only one country has a national Open Data portal, the scores for Portal Maturity cannot be compared. This single country scores only 14 points out of the possible 250 points. With regard to Open Data Maturity, all EU candidate countries can be categorised as Beginners.

Looking more in depth at the Open Readiness scores for the EU candidate countries shows that only 18% of the potential points were scored. The results are shown in Table 8. The countries scored best on the licensing norms and on policies. Half of the candidates already have an Open Data policy. However, not all countries have policies supporting re-use of Open Data. Approaches to guarantee that available data is up-to-date are not yet in place. An important step that can be taken towards Open Data Maturity could be outlining a national five-year Open Data strategy. Most of the EU candidate countries are lacking such a strategy. The countries that do have an Open Data policy in place are advanced when it comes to licensing norms. They support data free of charge and open licensed.

Indicator	Total score	Maximum score	Percentage obtained
(Open) Data Policy	480	1800	27%
Coordination at national level	80	780	10%
Licensing norms	125	420	30%
Use of Open Data	40	1200	3%
Political impact	190	720	26%
Social impact	75	360	21%
Economic impact	60	720	8%
Open Data Readiness	**1050**	**6000**	**18%**

Table 8 - Open Data Readiness scores for EU candidate countries

Due to the lack of national Open Data portals in most of the EU candidate countries, the countries score low on the use of Open Data. The focus should be placed on approving and installing the right policies and licensing norms and developing a national data portal (if not in place yet) first. If the basis is set correctly, the use of Open Data will increase.

Regarding the impact of Open Data, the social- and political impact are the highest expected impact. Open Data impacts efficiency and transparency in the EU candidate countries. The impact on sustainability and the inclusion of marginalized groups is medium. The economic impact of Open Data needs to be further assessed when the right policies are in place.

7. Conclusion

Within this report, the results from the landscaping are discussed to obtain an overview of the maturity of Open Data for the EU28+ countries. Across both indicators on Open Data Readiness and Portal Maturity, the landscaping shows that European countries are clearly advancing on their approach to Open Data. Despite discrepancies across countries as a whole, approximately half of countries are considered as Followers, insomuch that the basics of an Open Data Policy and Portal are set and data is increasingly available. Ten countries are considered as Trend Setters, as they lead and pave the way for other countries in enhancing their portals and further implementing their Open Data Policy.

Nonetheless, a series of barriers remain in order to continue the journey successfully. These barriers are similar from one country to the next and are categorised as political, legal and technical barriers. In addition, barriers appear around communication and user-engagement.

In order to move forward, a series of recommendations is formulated. The development of an Open Data strategy is the starting point in moving forward. Additional recommendations address the development of certain basic functionalities for national data portals, increasing awareness around Open Data, offering training, and consolidating political buy-in. Furthermore, local initiatives could benefit from more guidance at the national level to ensure interoperability in data sets.

A key next step consists of measuring the success of national Open Data policies. Better insight into the benefits of Open Data and highlighting the re-use of Open Data will stimulate the release of new data sets and will further contribute to the re-use of Open Data.

EU candidate countries are at the beginning of their Open Data journey as they start launching Open Data Policies. These countries can clearly benefit from the lessons learned by the EU28+ and accelerate their activities in the field of Open Data.

Finally, the landscaping has fulfilled its promise by offering clear insight into where all European countries stand on their Open Data journey. By bringing further qualitative insight into the policies developed – or absence of a policy – as well as barriers faced, the European Data Portal benefits from detailed insights into quick wins across Europe.

Annex I – Detailed scoring

		# indicators	Answer	Scoring
	2.2 Presence of (Open) Data policy	**20**		**500**
	2.2.1 (Open) Data Policy	**12**		300
1	Q2.1 Is there an (open) data policy in your country?		Yes	20
			No	0
2	Q2.2.1 Are there policies supporting the re-use of public sector information? Within public administration? By the private sector		Yes	20
			No	0
3	Q2.2.2 Is your Open Data Policy the same as your Public Sector Information Policy?		Yes	10
			No	0
4	Q2.3.1 Is there a national (open) data portal in your country?		Yes	30
			No	0
5	Q2.3.2 Are there also regional, local portals?		Yes	20
			No	0
6	Q2.4 Can all the different Public Sector Data Holders (ministries, departments,etc) upload data themselves to the portal?		Yes	20
			No	0
7	Q2.5 What is the frequency in collecting the data from the relevant public sector data holders?		Daily	50
			Weekly	30
			Monthly	15
			Less frequently	0
8	Q2.6 Is there a pre-defined approach to ensure the data sets are up-to-date?		Yes	20
			No	0
9	Q2.7 Are there priority domains for the release of data?		Yes	10
			No	0
10	Q2.8 Is open data used in decision making? In other words are public administrations making use of the data as evidence to be included in evidence based policy making.		Yes	20
			No	0
11	Q2.9 Have there been national or inter-regional events held annually to promote open data and PSI re-use (organized by whichever organization or group)? (e.g. hackathon, events)		Yes, less than 4	20
			Yes, between 4 - 8	30
			Yes, more than 8	50
			No	0
12	Q2.10 Is there a national strategy in terms of open data for the next five years?		Yes	30
			No	0
	2.2.2 Licensing Norms	**3**		70
13	Q2.15 Is the data available on the Portal for free of charge?		Yes	30
			No	0
14	Q2.16 Is the data available on the Portal open licensed?		Yes	25
			No	0
15	Q2.17 Is there a national data policy providing for a standard license (or suite of licenses) that public sector bodies are encouraged to avail themselves of when allowing PSI re-use?		Yes	15
			No	0
	2.2.3 Extent of Coordination at National Level	**5**		130
16	Q2.11 Do you have national guidelines on the publication of public sector information?		Yes	20
			No	0
17	Q2.12 Are cities or regional governments running their own open data initiatives? Such as dedicated data policies, portals, etc.?		Yes	10
			No	0
18	Q2.13 How would you describe city/ regional open data initiatives in your country? Are there very few / some / many city/ regional(open) data initiatives?		Very few	0
			Some	10
			Many	40
19	Q2.14.1 Are city/regional portals and data sets integrated into the National Portal?		Yes	30
			No	0
20	Q2.14.2 Is this the case for		Few	0
			Some	10
			Many	20
			All	30

		# indicators	Answer	Scoring
	2.3 Use of Open Data	**5**		**200**
21	Q3.1 How many unique visitors go to your Portal every month? Please fill in accordingly		0 - 9	0
			10 - 999	5
			1000 - 1999	20
			2000 - 2999	25
			3000 - 3999	30
			4000 - 4999	35
			5000 - 9999	40
			10000 - 19999	60
			>20000	80
			I don't know	0
22	Q3.2 Is there a distinction made between human and machine accessibility of the Portal? Can machines access your Portal via a specific API?		Yes	40
			No	0
23	Q3.3.1 What is the typical profile of your visitor?		Mostly private sector	10
			Mostly public sector	10
			Mostly citizens	10
			A bit of everything	25
			I don't know	0
24	Q3.3.2 How is the percentage of visitors spread across National ..% Foreign ..%		Foreign 0 - 4%	0
			Foreign 5 - 14%	10
			Foreign 15 - 29%	20
			Foreign 30 - 44%	30
			Foreign 45 - 59%	20
			Foreign >60%	10
25	Q3.3.3 What proportion of traffic is generated by a human and what is accessed by the API (i.e. Machine traffic) Human..% Machine ..%		Human 0 - 4%	0
			Human 5 - 14%	5
			Human 15 - 29%	10
			Human 30 - 44%	15
			Human 45 - 59%	20
			Human 60 - 74%	25
			Human 75 - 89%	20
			Human 90 - 100%	15

		# indicators	Answer	Scoring
	2.4 Impact of Open Data	**9**		**300**
	2.4.1 Political Impact	**3**		120
36	Q4.1 Has open data had an impact on increasing government efficiency and effectiveness?		Yes	30
			No	0
37	Q4.2 Has open data had a low/medium/high impact on increasing government efficiency and effectiveness?		Low	0
			Medium	20
			High	40
38	Q4.3 Has open data had a low/medium/high impact on increasing transparency and accountability in the country?		Low	0
			Medium	20
			High	50
	2.4.2 Social Impact	**2**		60
39	Q4.4 Has open data had a low/medium/high impact on environmental sustainability in the country?		Low	0
			Medium	15
			High	30
40	Q4.5 Has open data had an impact on increasing the inclusion of marginalized groups in policy making and accessing government services?		Low	0
			Medium	15
			High	30
	2.4.3 Economic Impact	**4**		120
41	Q4.6 Have there been macro-economic studies assessing the market value of open data? e.g. untapped business opportunities represented by the use of open data?		Yes	40
			No	0
42	Q4.7 Have there been studies on assessing better service delivery for users of public services?		Yes	30
			No	0
43	Q4.8 Are there any additional studies on the impact of open data in your country that you would like to share with the research team?		Yes	20
			No	0
44	Q4.9 What kind of funding model has been developed when setting up the Portal		Profit Maximizing	0
			Average Cost / Cost Recovery	10
			Marginal (Zero) Cost Model	30

		# indicators	Answer	Scoring
	Extra	**12**		**250**
	Usability of the portal	**5**		100
1	Are feedback mechanisms available to the user to give his opinion on the service? (any type: user satisfaction monitoring, polls, surveys, fora, comments etc).		Yes	20
			No	0
2	Users can both download and contribute the datasets. If contribute		Yes	20
			No	0
3	Users can only read and download datasets. If download		Yes	10
			No	0
4	Users can only read or access the content on the portal		Yes	10
			No	0
5	Is there a distinction made between human and machine accessibility of the Portal? Can machines access your Portal via a specific API? If API		Yes	40
			No	0
	Re-usability of the portal	**3**		100
6	Is the data available in machine readable format? What proportion?		≥ 90%	60
			70 - 89%	50
			50 - 69%	40
			40 - 49%	30
			25 - 39%	20
			≤ 24%	10
			No	0
7	Is the data available in bulk?		Yes	20
			No	0
8	Frequency of distributions by file format. If file formats are searchable		Yes	20
			No	0
	Spread of data across domains	**4**		50
9	Data volume per country. If more than 1500 datasets		Yes	10
			No	0
10	Is the dataset up to date? Frequency of harvesting weekly or daily?		Yes	10
			No	0
11	What data is targeted? What data are we talking about – different types of domains? If domains are searchable		≥ 20	20
			< than 20, thus X	X
			No	0
12	Are there at least two / six / twelve local or regional governments that publish at least 10 PSI data sets for re-use? If >2 local organisations publish > 10 datasets		Yes	10
			No	0

Annex II – Domains listed in the G8 Open Data Charter

To adopt an internationally recognised approach in structuring data sets, the consortium uses the domains listed in the G8 Open Data Charter.[26]

Data Category* (alphabetical order)	Example datasets
Companies	Company/business register
Crime and Justice	Crime statistics, safety
Earth observation	Meteorological/weather, agriculture, forestry, fishing, and hunting
Education	List of schools; performance of schools, digital skills
Energy and Environment	Pollution levels, energy consumption
Finance and contracts	Transaction spend, contracts let, call for tender, future tenders, local budget, national budget (planned and spent)
Geospatial	Topography, postcodes, national maps, local maps
Global Development	Aid, food security, extractives, land
Government Accountability and Democracy	Government contact points, election results, legislation and statutes, salaries (pay scales), hospitality/gifts
Health	Prescription data, performance data
Science and Research	Genome data, research and educational activity, experiment results
Statistics	National Statistics, Census, infrastructure, wealth, skills
Social mobility and welfare	Housing, health insurance and unemployment benefits
Transport and Infrastructure	Public transport timetables, access points broadband penetration

26 https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/207772/Open_Data_Charter.pdf