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# PUBLIC DATA IN THE DIGITAL DATA MARKET. PART 2. – THE ROLE OF OPEN GOVERNMENT DATA IN THE TRANSFORMING OF SOCIETY AND THE ECONOMY

## 1. Development of the field of use of open government data

Open government data efforts have evolved over the years into a global phenomenon. Countries have learned from each other, and more and more efforts are being directed towards innovation with open government data, by encouraging co-creation and other incentives. Open data should support goals such as innovation, participation, transparency and accountability. The trend is towards creating sustainable open government data and intelligence through the use of artificial intelligence and the creation of data markets.

Open Government Data (OGD) initiatives have spread rapidly in recent years<sup>1</sup>. Open Government Data is the publication of public sector information in an open and reusable format, without restriction or monetary cost, for use by society.<sup>2</sup> The main aim of the movement is to ensure transparent administration and to encourage citizen participation and engagement. In addition, open government data can contribute to creating public value through innovation.<sup>3,4</sup> Based on these motivations, the European Union (EU) and the US have taken the lead in launching open government data activities. More recently, open government data initiatives have taken off in other parts of the world, where both the number of open government data sites and the number of data sets have steadily increased.<sup>5</sup> Public sector information is an important raw material for digital content products and services and is becoming an increasingly important source of content as wireless content services develop. Public sector information is a unique data resource that can contribute to the development of the European internal market and to the deployment of new applications for users and legal entities. Smart data use, including the management of data through AI-based applications, can have an impact on all sectors of the economy. The Directive on Open Data and Re-use of Public Sector Information, also known as the “Open Data Directive”<sup>6</sup>, entered into force on 16 July 2019. The review process leading to the adoption of the Open Data Directive started in 2017, when the European Commission launched an online public consultation on the revision of Directive 2013/37/EU (PSI Directive). Member States had until 17 July 2021 to adopt the new Directive into their national legislation.

Public Sector Information (PSI), sometimes also called government data, refers to all information produced, collected or obtained by public bodies. Examples include geographic information, statistics, weather data, data from publicly funded research projects and digitised library books. European Commission policy focuses on creating value for the economy and society through the re-use of this type of data. “In the Member States, the public sector collects, produces, reproduces and disseminates information on a wide range of activities, including social, political, economic, legal, geographical, environmental, meteorological, seismic, tourism, business, patent and educational fields. The documents produced by the executive, the legislature or public sector organisations in the judiciary constitute a vast, diverse and valuable resource pool that can benefit society.”<sup>6</sup>

Open data in the context of this study is information that anyone is free to use, modify and share for any purpose. It should be available under an open licence and made available in a suitable and modifiable format that is machine readable. Open government is based on the “open availability of government data for use, redistribution, and processing by anyone at no or low cost”.<sup>7</sup> By default, the philosophy of open data is based on openness. That is, rather than justify-

ing why a given data should be made publicly available and reused, data owners should adopt the approach that the default is that data should be open by default. There are, of course, exceptions to this rule where there are important reasons to restrict access to the data. This default is a paradigm shift from so-called positive data freedom (clearly defining what can be opened) to negative data freedom (clearly defining what must be closed). Besides the immediate cost-benefit considerations, there are three main reasons why certain data should not be open:

- the EU aims to protect the privacy of citizens and individuals,
- protect trade secrets, and
- protects data covered by national security.

A successful transition to a negative data freedom paradigm requires clear, universal rules on which data access and uses should be prohibited. Ensuring access to data and easy access to data for all parties has many benefits for both data owners and data users.

Open data supports:

- Ensuring and increasing transparency. Open data helps to monitor the functioning of public organizations, track the use of public funds, increase transparency and improve the reliability of scientific results.
- Re-evaluation of data, extending reuse. Re-use and its effects can be demonstrated much later than the values generated by the collection and primary use of data.
- Exploiting network effects. Network effects are enhanced and better exploited by extending the scope of open data, as more elements can be combined. All new open data adds value to the economy as a whole.
- Collecting feedback based on the viewing of open data. Feedback helps internal analysis, showing insights from external sources.

The creation of technological innovation. By ensuring full and easy access to data, the Directive (2019/1024/EC) supports experimentation and innovation.

The high value data sets referred to in Article 13(1) of Directive 2019/1024/EU:

1. Spatial data
2. Earth observation and environmental data
3. Meteorological data
4. Statistics
5. Company and business ownership data
6. Mobility data

These data sets are of particular importance for the growth of economic potential.

Scientific research on open government data has also developed rapidly. There is now a wealth of studies on open government data. For example, some publications have examined the factors that triggered the uptake of open government data initiatives across government agencies,<sup>8,9,10</sup> while some studies have examined open government data-driven innovation activities,<sup>11</sup> and some have evaluated the quality and impact of open government data initiatives.<sup>12,13</sup> There are many literature reviews on open government data. As a guide for future research development, HOSSAIN<sup>14</sup> assessed the state of open government data research from three levels and suggested future directions, while ATTARD<sup>15</sup> examined existing open government data research tools and approaches and identified challenges and issues that hinder initiatives from realising their full potential.

Finally, SAFAROV<sup>16</sup> tried to provide a framework for the use of open government data to suggest future research directions. These reviews are beneficial for research development, but no attempt has been made to understand the evolution of research.

A concerted effort is still needed at both EU and Member State level to gather new data and facts on the economic impact of open data - both in terms of public sector information and private data. With more accurate data and estimates, the huge potential that data offers for European economies can be further underpinned. Open data should be seen as a subset of the wider European data economy, and by opening up public data, it can pave the way for the re-use of additional data such as statistical, fiscal, spatial and urban data. By opening up public data in the reverse direction and possibly introducing its collection, i.e. opening up private data for public use, further sectors with huge potential can be identified and this untapped potential can be exploited.

Several benefits of using open data can be identified, consisting of direct and indirect benefits.

- Direct profit is a monetary profit realised in market transactions
  - renewe and gross value added (GVA),
  - the number of jobs related to the production of the service or product, and
  - in the form of cost savings.
- Indirect economic benefits
  - new products and services,
  - saving time for applications using open data,
  - the growth of the knowledge economy,
  - increased efficiency in public services and growth in related markets.

#### *Access to open government data and public sector information*

The vast majority of government initiatives on data sharing and reuse focus on access to and sharing of public sector data (almost 65% of all initiatives), with most of them aiming to enable open access to government data (open government data). Even before the emergence of open data initiatives in the US, UK, France, Japan or Singapore, governments recognised that public sector data should be provided “at the lowest possible cost, preferably no more than marginal cost”. in the OECD.<sup>17</sup> This justified the creation of PSI initiatives.

In many countries, PSI initiatives were legally underpinned by freedom of information legislation and therefore had a wider scope than open data initiatives.<sup>18</sup> As a result, many countries have PSI initiatives, while others have open data initiatives or both. This is the case for the EU Member States covered by Directive (EU) 2019/1024 of 20 June 2019 on open data and re-use of public sector information. This Directive replaces the Public Sector Information Directive (Directive 2003/98/EC). Nevertheless, there is a general trend in the OECD towards the creation of open data portals.

## 2. OECD Going Digital project

An ecosystem of interdependent digital technologies underpins digital transformation; its continued evolution continues to drive economic and societal change. This digital technology ecosystem relies on and produces vast amounts of data, which has become an important source of economic and social value. The OECD’s Going Digital project aims to help decision-makers better understand the ongoing digital transformation and develop appropriate policies to shape a positive digital future.

The Going Digital Summit in March 2019 marked the end of Phase I (2017-2018) with the publication of Going Digital: setting policy, improving quality of life and measuring digital transformation: a roadmap to the future. Phase II (2019-2020) addressed new opportunities and challenges through the analysis of frontier technologies, notably artificial intelligence and blockchain, with a continued focus on jobs, skills and inclusion, as well as productivity, competi-

tion and market structures. One of the key outcomes of Phase II was the launch of the OECD.AI Policy Observatory in February 2020. OECD.AI will produce data and multidisciplinary analysis and share it for the use of responsible, trusted artificial intelligence. The Going Digital Integrated Policy Framework and the OECD Going Digital Toolkit are key products that provide a framework for all OECD thinking on digital transformation. In the third phase of the project (2021-2022), four data-related thematic clusters have been launched to understand and shape digital transformation and its impact on our economies and societies:

- data management, access, sharing and control;
- facilitate cross-border data flows while preserving trust;
- the use of data and its impact on firms and markets;
- measuring data and data streams.

Data and its flows, including across borders, underpin economic activity and prosperity in global digital economies and societies. The COVID-19 pandemic has highlighted how data can provide key, life-saving services. At the same time, it highlighted persistent gaps in the availability of data, particularly real-time health data, which reduce this potential and could impact on countries’ preparedness for future crises. Access to data can empower consumers to make better purchasing and lifestyle choices, including embracing social goals such as sustainable consumption patterns. However, this potential remains largely untapped. For firms, the use of data can drive productivity and innovation, but the uptake of key data processing technologies such as data analytics and artificial intelligence remains skewed towards larger firms. Governments can use data to improve the design and delivery of public policies and services, but public sector data management frameworks are often siloed and limited to specific domains or applications, and thus do not address policy issues related to data management.

Most data is collected by organisations that seem to value its control and use, but efforts to measure the value of data are still evolving. The main growth and prosperity potential of data depends on increased data openness: the more data can be shared and reused, the more it can drive growth and prosperity. However, increased access and sharing can carry risks, including concerns about privacy, personal data protection and intellectual property rights infringements, as well as digital security risks. In parallel, the growing collection of data by companies has raised concerns about competitive dynamics. These concerns are supported by empirical evidence of slowing productivity growth, increasing industry concentration and widening gaps in technology adoption across firms of different sizes across the OECD. Regulatory and policy measures to address these risks and challenges, including the conditions for cross-border data flows, may have unintended consequences for other policy objectives and undermine the benefits of data use. Leveraging commonalities between countries through informed policy-making, including the adoption of organisational and technical measures, can support more credible policy approaches that address these risks and foster trust, while allowing responsible access and sharing of data.

#### *The strategic importance of data use*

Data has become a strategic tool that can change lives and markets, and can empower economies and markets. Why data as a source of value and potential competitive advantage has become a priority for individuals, organisations and nations. At the same time, it carries risks associated with the collection and use of data. The stakes of data use and misuse have increased. Data are a strategic asset for economies and societies because of their potential benefits. Data are used through two main channels. First, insights from processing and analysing data can reveal patterns and relationships that enable better, evidence-based decision-making. For consumers, this can mean better and stronger purchasing decisions. For firms, data can be seen as an input to production, including in combination with other more traditional economic factors such as labour or land. Second, data can bridge the gaps between consumers and producers,

and governments and citizens, facilitating new transactions and creating new markets. For example, the collection and sharing of data allows for greater transparency between unknown third parties online. This allows them to overcome previous information asymmetries that may have hindered successful interaction or transactions.

Through these two channels, the use of data, including its cross-border transfer, can improve individual well-being and address societal challenges, as well as boost innovation and productivity. Data has great potential in many areas of the economy and society. This includes areas such as the planning and delivery of public services; science, research and development; education system monitoring and improvement; spatial management, including smart cities.<sup>18</sup> Similarly, cross-border data flows play a facilitating role in digital commerce, including global value chain coordination.<sup>19</sup>

*The fundamental change in data use is also reflected in public policies at national and international level*

The COVID-19 crisis, for example, highlighted the need for timely data for decision-making. Data were essential to track the spread of the virus, including to trace contacts in confirmed cases and to enable surveillance. For example, in Korea, geolocation data, CCTV footage and credit card records were used to track patients with coronavirus<sup>20</sup>. In Israel, geolocation data was used to identify people in contact with virus carriers. This allowed authorities to notify them of immediate isolation. In the first half of 2020, few countries scored high on the availability, maturity and use of datasets, as well as on dataset governance.<sup>21</sup>

However, by 2021, 15 of the 24 OECD countries surveyed will have introduced legislative, regulatory or policy reforms to improve the availability, accessibility or sharing of health data. Meanwhile, 16 of these countries have introduced new technologies to improve the management of health data. Governments have introduced measures to improve data connectivity and sharing, and to improve sectoral capacity. As a result of these reforms, most of the countries surveyed have seen significant improvements in the timeliness and quality of key health data sets.<sup>22</sup>

*Pathways to greater trust and interoperability*

Ensuring the free flow of data with confidence remains a challenge for policy makers. Different solutions to this complex challenge have emerged, leading to a fragmented regulatory environment that makes it difficult for individuals, businesses and governments to operate in a 'trusted' environment. This report highlights a number of commonalities, complementarities and elements of convergence on which policy makers can build as they look for ways to further enhance trust and foster future interoperability.

First, there are common features between regulatory and policy instruments. For example, whether through unilateral mechanisms, trade agreements or intergovernmental agreements, there seems to be a consensus on the dual goals of data protection and cross-border flows (although there are differences on how best to achieve these goals). Moreover, domestic frameworks generally provide relatively similar unilateral mechanisms for transferring data with safeguards (although there are differences in how and by whom the safeguards are implemented).

Second, there is also growing evidence of elements of convergence, often based on the commonalities mentioned above. For example, there are indications that frameworks for privacy and personal data protection, including intergovernmental agreements, are converging towards more similar principles. Trade agreements also show signs of convergence, with data flow provisions becoming more binding and using more similar language. Convergence is also seen in the context of increased recognition of data intermediaries as approaches to facilitate data sharing (e.g. those using privacy-enhancing technologies).

Finally, the tools are highly complementary. Unilateral instruments derive from and contribute to intergovernmental agreements. Meanwhile, trade agreements increasingly refer to intergov-

ernmental data protection agreements as part of their mandatory data flow provisions. More recently, the EU-UK Trade and Cooperation Agreement has also introduced a requirement that measures to protect personal data and privacy must include unilateral instruments allowing for data flows. Discussions will continue. In fact, at the 2021 G20 meeting under the Italian presidency, leaders agreed to "continue to seek common understanding and work to identify commonalities, complementarities and elements of convergence between existing regulatory approaches and tools that enable the reliable flow of data to support future interoperability".<sup>23</sup> Similar language was used in the G7 Digital and Trade Declarations in 2021 and 2022.<sup>23,24</sup>

### 3. Barriers to PSI reuse and how to overcome them

Having the right information is key to solving problems. The public sector produces and stores valuable information in the form of data. When made open, data can be accessed and reused by anyone, including public organisations themselves. Re-using data helps to provide insights, improve services or products. It allows public organisations to improve the efficiency of internal processes, service delivery and data-driven decision making, which supports better policies and thus has a positive impact on society. The Public Sector Information (PSI) Directive<sup>25</sup> defines which data can be re-used and under which conditions. Although more and more data sets are open, public organisations are not yet reaping the benefits of their re-use. The report explores the barriers to PSI re-use in the public sector.

The barriers identified fall into three categories:

1. Supply-demand gap in PSI issuance
2. Lack of awareness of the availability and benefits of PSI
3. Inadequate management of skills

The public sector from making data available to actually making it available A common barrier to PSI re-use is a lack of knowledge sharing and inadequate management of processes and capabilities. Solutions to overcome these barriers follow three main approaches:

1. Building a culture of data sharing
2. Allowing PSI reusers in the public sector
3. Creating the organisational capacity to reuse PSI

Open data is the most visible approach to improving access to data and the most extreme form of openness. In the public sector, open government data has been promoted for years by initiatives such as data.gov (US), data.gov.uk (UK), data.gov.fr (France) and data.go.jp (Japan). Open data should be accessed on "equal or non-discriminatory terms", limiting the conditions under which data can be made available through open access. In most cases, for example, confidential data such as personal data cannot be shared through open access. Furthermore, as highlighted above, the provision of open data is expected to be free of charge, or at most for the marginal cost of production and dissemination. Therefore, businesses that wish to commercialise their data either directly (by selling data) or indirectly (by providing value-added services) may find open data less attractive.

Public and private sector organisations are increasingly recognising that non-discriminatory access is key to maximising the (societal) value of data: it creates new business opportunities and economic and social benefits. However, measuring the resulting economic and social benefits of the shift towards open data remains a challenge. As Dan MEISNER, Head of Open Data at Thomson Reuters, pointed out, indirect benefits and network effects "don't really fit into an Excel model for calculating internal rates of return".<sup>27</sup> Limited data sharing agreements may sometimes be more appropriate. In some cases, data are considered too confidential to be shared openly with the public. In other countries, there are legitimate interests (commercial and non-commercial) that oppose such sharing. Privacy, intellectual property (e.g. copyright and trade secrets), and organisational or national security concerns are legitimate barriers to open sharing of data. In these cases, however, data users within a restricted community may still have a strong economic and/or so-

cial rationale for sharing data on voluntary and mutually agreed terms.

It is common to find limited data sharing agreements in several areas. These include digital security, science and research, and as part of business arrangements for shared resources (e.g. within joint ventures). These voluntary data sharing agreements may be based on commercial or non-commercial terms, depending on the context. The following sections highlight two types of arrangements. First, data partnerships recognise that data sharing brings significant economic benefits to both data users and data owners. Second, social purpose initiatives share data to support social goals.

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Nevertheless, there is a general trend in the OECD towards the creation of open data portals. Directive (EU) 2019/1024 of the European Parliament and of the Council of 20 June 2019 on open data and the re-use of public sector information states that „Access to information is a fundamental right. The Charter of Fundamental Rights of the European Union (hereinafter “the Charter”) states that everyone has the right to freedom of expression, which includes freedom to hold opinions and to hold and impart information and ideas without interference by public authority and regardless of frontiers.”<sup>27</sup>

It states that “Allowing the re-use of documents held by public sector bodies creates added value for the benefit of downstream users, end-users and society in general, and for public sector bodies by promoting transparency and accountability and, in many cases, by providing feedback from downstream users and end-users, allowing the public sector bodies concerned to improve the quality of the information collected and the performance of their tasks.”<sup>27</sup>

Studies measuring the impact of Open Data initiatives emphasise the importance of open data for economic growth, to promote monetary benefits and to promote transparency. Since there is generally a zero marginal cost to using open data, there are likely to be additional economic benefits if more organisations reuse open data. Sharing and reusing data allows individuals and organisations to solve problems they face more efficiently and quickly, as more data is available, digitally accessible and reusable. Existing products, services and processes can be improved and new initiatives can be more easily implemented. The benefits are time savings, cost reductions and quality improvements.

The complexity of publishing, retrieving and reusing information leads to increasing complexity and growing potential, which generally requires transformation by organisations and individuals. Specifically, transforming mindsets, skill sets, strategies and processes will result in unlocking potential and successfully addressing the complexity and challenges of the situation. For the public sector, the reuse of public data increases transparency, accountability and efficiency. It can improve internal processes, service delivery and facilitate data-driven decision making that supports better policies and therefore positively impacts society.

The OECD’s study, *The economic impact of Open Data: Opportunities for value creation in Europe*, compares the different methods and approaches used in previous studies in previous years to measure the economic impact of open data.<sup>28</sup> In summary, it can be concluded that previous (pre-2020) methods and procedures that attempted to estimate economic value are unreliable and have a number of shortcomings:

- are not transparent, it is often not clear how the results are calculated and which numbers and resources are used in these calculations. This lack of transparency makes it difficult to verify results and to replicate studies.
- The assumptions are not clearly formulated, which makes it difficult to understand the reasoning behind the approaches used and the validity of the results.
- It is often unclear whether the approaches and methodologies used are based on existing literature.
- The scope of open data is often unclear, with concepts such as data, open data, public sector information and open government data being used interchangeably.
- Few studies apply the macroeconomic and microeconomic approaches together, combining quantitative, qualitative and case study analysis.
- Few studies collect primary data, such as questionnaires, interviews or expert discussions, and most use only secondary data for their research, often from outdated literature.
- The studies have different scopes and use different taxonomies, making them difficult to compare.

Open data used to be almost identical to the set of open government data. This is changing, however, as the complexity of the data and the range of capabilities and relationships that require reuse of the data are changing. The concept of open data is also increasingly being used in the private sector.

#### *Data-driven innovation*

The term “data-driven innovation” refers to the ability of businesses and public organisations to use information from advanced data analytics to create services and products that make the daily lives of individuals and organisations, including SMEs, easier.<sup>29</sup> Open data may seem like a valuable raw material, but its benefits are best realised through transformation, analysis, aggregation and synthesis. Quantitative measurements from a study of 61 countries<sup>30</sup> showed that openness positively influences society’s ability to create value from data through innovation mechanisms. Data-driven innovation positively influences value through the generation of new knowledge, new processes, services and products, and new businesses.<sup>31</sup> Data-driven innovation can lead to dramatic transformation of public sector systems and create societal benefits such as less pollution, less traffic congestion, better monitoring of disease outbreaks, greater energy efficiency, new agricultural services, novel applications to increase citizen engagement through online interaction.

The Digital Agenda for Europe is one of the seven flagship initiatives of the Europe 2020 strategy, designed to identify the key role of ICT applications in the successful delivery of Europe 2020 goals. The overall aim of the Digital Agenda is to deliver sustainable economic and social benefits through a single digital market based on high-speed and superfast internet and interoperable applications.<sup>32</sup> The strategy is structured around three growth priorities and seven flagship initiatives:

- smart growth in terms of effective investment in education, research and innovation; the related flagship initiatives are the Innovation Union, the Digital Agenda for Europe, Youth on the Move;
- sustainable growth for a shift towards a low-carbon economy; the interlinked flagship initiatives for a resource-efficient Europe, an industrial policy for the globalisation era;
- inclusive growth, job creation and poverty reduction measures; the related flagship initiatives are the New Skills and Jobs Agenda, the European Platform against Poverty.



The flagship initiative of the Innovation Union is to create the best conditions for European researchers and entrepreneurs to innovate, by launching the Digital Agenda, an industrial policy, a resource-efficient Europe and the Single Market Act.<sup>33</sup> The Innovation Union has identified two platforms to develop its flagship initiatives:

- *European Technology Platforms* (ETPs) are industry-led stakeholder fora, which aim to define medium and long-term research and technology goals and roadmaps, with industry-led access;<sup>34</sup>
- *European Innovation Partnerships* (EIPs), a new approach to EU research and innovation, bring together public and private stakeholders to accelerate the diffusion of major innovations. In doing so, they engage them to implement supply and demand-side measures (funding, regulation, standards, procurement, etc.) across sectors and the whole innovation system (demand-driven); The EIPs' areas
  - Active and healthy aging (EIP-AHA);
  - Agricultural Sustainability and Productivity (EIP-AGRI);
  - Smart Cities and Communities (EIP-SCC);
  - Water (EIP-W);
  - Raw materials (EIP-RM).<sup>35</sup>

With this initiative, the EU has created a framework for a system of digital data flows and platforms.

## Summary

Studies measuring the impact of Open Data initiatives emphasise the importance of open data for economic growth, to promote monetary benefits and to promote transparency. Since there is generally a zero marginal cost to using open data, there are likely to be additional economic benefits if more organisations reuse open data. Sharing and reusing data allows individuals and organisations to solve problems they face more efficiently and quickly, as more data is available, digitally accessible and reusable. Existing products, services and processes can be improved and new initiatives can be more easily implemented. The benefits are time savings, cost reductions and quality improvements. The central objective of the Europe 2020 strategy is to put the European economy on a strong and sustainable growth path. Achieving this goal requires increasing Europe's innovation potential and making the most efficient use of available resources. One group of these resources is public data, i.e. information created, collected or purchased by public bodies located in the European Union. The dynamic development of the European data market and the data economy suggests that a country that does not recognise the potential of re-using public data is missing out on economic potential, with potentially negative long-term consequences.

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