Roadmap for open data and open government

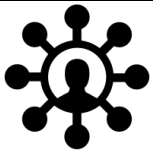
Description and state of the art	
Definition	Open government and open data are two highly intertwined concepts. Open Government stands for the governing doctrine which holds that citizens have the right to access the documents and proceedings of the government to allow for effective public scrutiny and oversight. Overall, Open Government is widely seen to be a key hallmark of contemporary democratic practice and is often linked to the passing of freedom of information legislation[344]. In addition, the adoption of an open government approach enables the implementation of a government as a platform paradigm[345] in which private entities are involved in the delivery of services of public interest. Open Data plays a crucial role allowing the implementation of open government practices. As a matter of fact it refers to the idea that some data should be freely available to everyone to use and republish as they wish without restrictions from copyright, patents and other mechanisms of control.[344]
Addressed societal /business or public sector need	Business need: Promote an entrepreneurial and star-up culture
Existing solutions /applications /services	Open data could help entrepreneurs to find necessary information about a specific region or economic or legislative conditions or they may be used as an input for the delivery of service. There are a lot of initiatives which provide businesses with public sector information e.g.: • EU Open Data Portal[346] • European Data portal[347] • Policy Compass Portal[291] • Public Contracts [348]

	• Open Coesione[251] • Visual OPML[252] • RES (Research and Education Space) [349] • 3cixty initiative of the Innovation Action Line Digital Cities[350] • Good Basic Data for Everyone" initiative in Denmark [351] • Publicspending.net[352]
 Main actors regarding R&D of this technology	• Intrasoft International SA, • Technische Universiteit Delft, • National Center for Scientific Research, • Demokritos, • Ayuntamiento de Zaragoza, • Foundation for Research and Technology Hellas, • Fraunhofer- Gesellschaft zur Förderungder Angewandten • Athena Research and Innovation Center in Information Communication & Knowledge Technologies, • Open Data Institute • Istituto Superiore Mario Boella • NEXA - Polito
 Current research activities	Open Access for Research:OPENAIRE2020, OPENAIRE, OPENAIRE+, PASTEUR4OA, FOSTER, RECODE, Infrastructure projects (with Open Accesscomponents): e.g. GEO/GEOSS, ELIXIR[41], Analytics for Open Data: FutureTDM, LinDA, COMSODE, ALIADA, EUCases, and more than150 EU projects regarding open data for specialised applications, e.g. in the area of environment (GROW), property data (proDataMarket), active aging (City4Age), energy consumption (HotMaps) or poetry standardization (POSTDATA). ICT-enabled open government(2014): ROUTE-To-PA, YDS, DIGIWHIST, WeLive, OpenBudgets.eu, YourDataStories, ICT-enabled open government (2015): smarticipate, RECAP, Mobile-Age, CLARITY, FLOOD-serv. Projects of other calls:OpenGovIntelligence, STEP, WeGovNow, OpenCube, ENGAGE, DIACHRON, VisiOn, E-GOS,VRE4EIC
 Impact assessment	**Public sector modernization:** • Leaner and faster service delivery • More transparency and accountability • Creation of trust and confidence in the public sector • Better access to services • Enhanced diffusion of best practices **Public Sector as an Innovation Driver:** • Public Sector Innovation as an input for profit activities • Public procurement as leverage for the promotion of the open data paradigm (e.g.: in science)

Necessary technological modifications		
 Potential use cases	Open data as well as open government based applications and services have already been widely experimented by the Commission as well as by Member States. In the following are included some examples promoted by public and private organizations: • the European Commission[353] open data portal including data all types of public sector information, • Open Parlamento providing data about the parliamentary activity of the Italian Government[354], • OpenCorporates[354] offering company data for businesses operating within and outside the EU.	
 Technological challenges	According the 2016 UN eGovernment Survey[355], the issue that many governments face today is not whether to open up their data, but how to do so. Proper governance and careful consideration of both opportunities and challenges is needed. Opening up government data poses a number of challenges, including issues related to legal frameworks, policies and principles, **data management** and protection, **identity management**, privacy and **cyber security**. In addition, **semantic enrichment** and **intuitive fruition** models represent further steps to be considered in order to improve the usefulness of the data made available.	
Necessary activities (in or for the public sector)		
 Development of a specific training necessary	**Open task**	A study[356] conducted by IDC and Open Evidence for DG Connect in 2016 defined **data workers** as workers who **collect**, **store**, **manage** and **analyse data** as their primary, or as a relevant part of their activity. Data workers must be proficient with the use of structured and unstructured data, should be able to work with a huge amount of data and familiar with emerging database technologies. They elaborate and visualize structured and unstructured data to **support analysis** and **decision-making** processes. The report depicts three scenarios for what concerns the evolution of the European need of data workers and the CAGR varies from 2 to 9% for a total number of data workers needed by **2020** that may be up to over **9 million units**.
 Advanced or	**Open task**	Open data can be published in and processed by so-called open data infrastructures. The work conducted by Zuiderwijk[357] shows that such infrastructures should provide **twelve basic functionalities**: 1) access, 2) searching,

adapted ICT infrastructure needed		3) navigation, 4) uploading, 5) downloading, 6) data quality, 7) analysis of datasets, 8) visualization, 9) linking and combining data, 10) collaboration, 11) support and help and 12) feedback. Requirements for the open data process are to a large extent related to functionalities of open data infrastructures. Nevertheless, the same study, acknowledges that the presence of a difference among infrastructures in terms of focus and in the functionalities provided may suggest that for users these open data infrastructures complement each other. This can be enhanced if all infrastructures would provide **open interfaces** to enable users to take advantage of the strengths of each infrastructure. In this way an **ecosystem** can be created in which the infrastructures are connected and can seemingly exchange information.
 Change of (public sector internal) processes necessary		No issues identified.
 Promotion / information of stakeholders necessary	**Open task**	A Scottish study concluded that e-government tools cannot reach their potential if the engagement process they are embedded within is not promoted and does not allow citizens to engage in a meaningful and accessible manner, within a suitable timeframe.[307] The promotion of open data/ open government initiatives is of particular relevance when transparency must be complemented with public engagement both for the creation of trust and for the crowdsourcing of control activities to civil society. This is the case for service **co-creation activities** such as peer-to-patent[358], fix-my-street[359] or openricostruzione[360] where the general public plays a crucial role in the process of turning open data into social value.

 Need to deal with cyber security issues	**Open task**	The European Commission adopted a **Cybersecurity Strategy[361]** in 2013 and more recently passed the **NIS Directive[362]** on security of networks and information systems. The commitment on security is due to the fact that digital technologies have become the backbone of our economy and are a critical resource all economic sectors rely on. They now underpin the complex systems which keep our economies running in, for example, finance, health, energy and transport. Many business models are built on the uninterrupted availability of the internet and the smooth functioning of information systems Cybersecurity incidents, be they intentional or accidental, could disrupt the supply of essential services we take for granted such as water or electricity. **Threats** can have different origins - including **criminal, terrorist** or **state-sponsored attacks** as well as **natural disasters** and **unintentional mistakes**.
 New or modified legislative framework or regulations necessary	**Open task**	The ESPI platform has released a report highlighting the main principles to be kept in mind in order to promote an ethical and responsible use of open data[363]. The first tension to be managed is the one between the **openness** and "**do no harm**" principles. The protection of promotion of transparency and accountability is the basic principle of modern democracies which is not questioned, but that has certain limitations linked to a "do no harm" principle encompassing concepts of privacy and security. One of the criteria to be manage such balance is suggested in the book "Ways to practise responsible development data"[364] is that the "do no harm" is for powerless and transparency and accountability is for powerful. Another important principle identified in the study is the **right to consent** as an essential ingredient in any process of data acquisition and analysis. Finally the study concludes by highlighting the role of **privacy** by pointing out that the largest part of the current debate about the responsible and ethical data re-use revolves around the preservation of privacy rights.

 Development of a common standard necessary	**Open task**	No database is an island. On this premise, the W3C together with a number of other actors such as Geothink, GovEx, the International Open Data Charter Technical Working Group and the US Data Federation is working towards the creation and widespread adoption of standards for open data[365]. Standards in the field of open data regulate the processes for **data treatment** and **exposure**, the **vocabularies** used for the description of relationships, the **localization of resources** through the use of persistent URIs.
 Need for a more economical solution	**Open task**	The Open Data Institute[366] highlighted the following common costs elements for consideration when developing and open data program: **set-up and technical**, **administrative and governance**, **skill development and community engagement**, **sustainability.** A number of options are available for the public sector to try reducing the current cost of open data management: **investing in automation** to reduce the need for human intervention, explore new models of **collaboration** with the **private sector[367]**, start **consider**ing **open data** not as a duty towards external stakeholders but rather **as an opportunity** to generate cost saving internal innovations.
Dealing with challenges		
 Ethical issues		No ethical issues identified
 Societal issues		No societal issues identified.
 Health issues		No health issues identified.

 Public acceptance		No public acceptance issues identified.