

# Study to establish road-maps on open-science & innovation and open-data infrastructure in support for S3 in partners of the “Lagging Regions” project

1st workshop, May 14th, 2019

---

## Context, project background and objectives

**“Data availability and comparability at regional level are central challenges in many countries. Being able to feed the RIS3 monitoring system by triangulating a variety of regionalised data would be ideal (...) for smaller regions it may be easier to obtain relevant and accurate data, whereas large regions have to obtain data on more complex processes involving many more organisations. Yet, access rights to regionalised data can be very costly”**

Gianelle, C. and Kleibrink, A. [\*Monitoring Mechanisms for Smart Specialisation Strategies\*](#). European Commission, Joint Research Centre, S3 Policy Brief Series No. 13/2015. P.14-15,

### SKILLS AND RESOURCES

- Statistics, research, communication, etc.
- Investment in time and effort

### STAKEHOLDERS ENGAGEMENT

- Nice idea, but...
- Elite capture, conformism, paralysis

### POLITICAL CHALLENGES

- Lack of supports, as results may be perceived as negative

### EMPIRICAL CHALLENGES

- data by priority -> difficult
- official statistics (when appropriate) not timely

### ORGANISATIONAL CHALLENGES

- Information may not flow within the organisation



The issue of open science, innovation and data for Smart Specialisation is currently unexplored. There is **no systematic understanding of what member states and regions are doing and whether it is effective.**

In order to advance our understanding and therefore support for monitoring smart specialisation, **the JRC is launching a study on open-science & innovation, and open-data in the regions taking part to the targeted support activities.**

1. **Analytical:** the case-studies will inform regions and member states of their strength/weaknesses/potential as well providing a gap-analysis of their system and a road-map to improve them.
2. **Learning:** the methodology of the case studies and the results will be discussed in a participatory setting, hence providing opportunities for sharing experiences and learning from each other.
3. **Policy:** the analytical and participatory activities will also lead to policy implications at the EU, regional and national level.

---

## Challenges and topics of interest

When establishing or monitoring smart specialisation strategies, policy-makers and S3 technicians face technical difficulties that become strategic challenges:

1. **A lack of granular data on research and innovation activities and results**, sufficiently detailed, recent, updated and openly available to different actors and stakeholders.
2. **A difficulty in accessing and integrating data from data sources owned by diverse actors**, with different formats, non disambiguated actors and heterogeneous classification systems and metadata.



3. A **difficulty to classify R&D activities and results in newly defined specialisation areas**, which do not tally well with existing scientific, technological and sectoral classifications and taxonomies.
4. A **partial and segmented view of the innovation process and of the overlapping public policies**, which are highly intertwined, but collected and described in different sources.
5. A **lack of benchmarking tools across geographies and specialization domains that have been specified ad-hoc, especially at the adequate level of granularity** needed for S3 priority-setting and monitoring.

- 1. Identify the main elements of S3 monitoring in the case studies:**
  - a. How do regions define impact of their S3 Strategy, at the aggregate level and by policy instruments?
  - b. What indicators have been defined? For what instruments?
  - c. What are the current priorities in S3 monitoring?
- 2. Understand how case study key users and audiences interact with information/data**
- 3. Identify and characterise global, EU and case studies' Open Data, Science and Innovation initiatives**

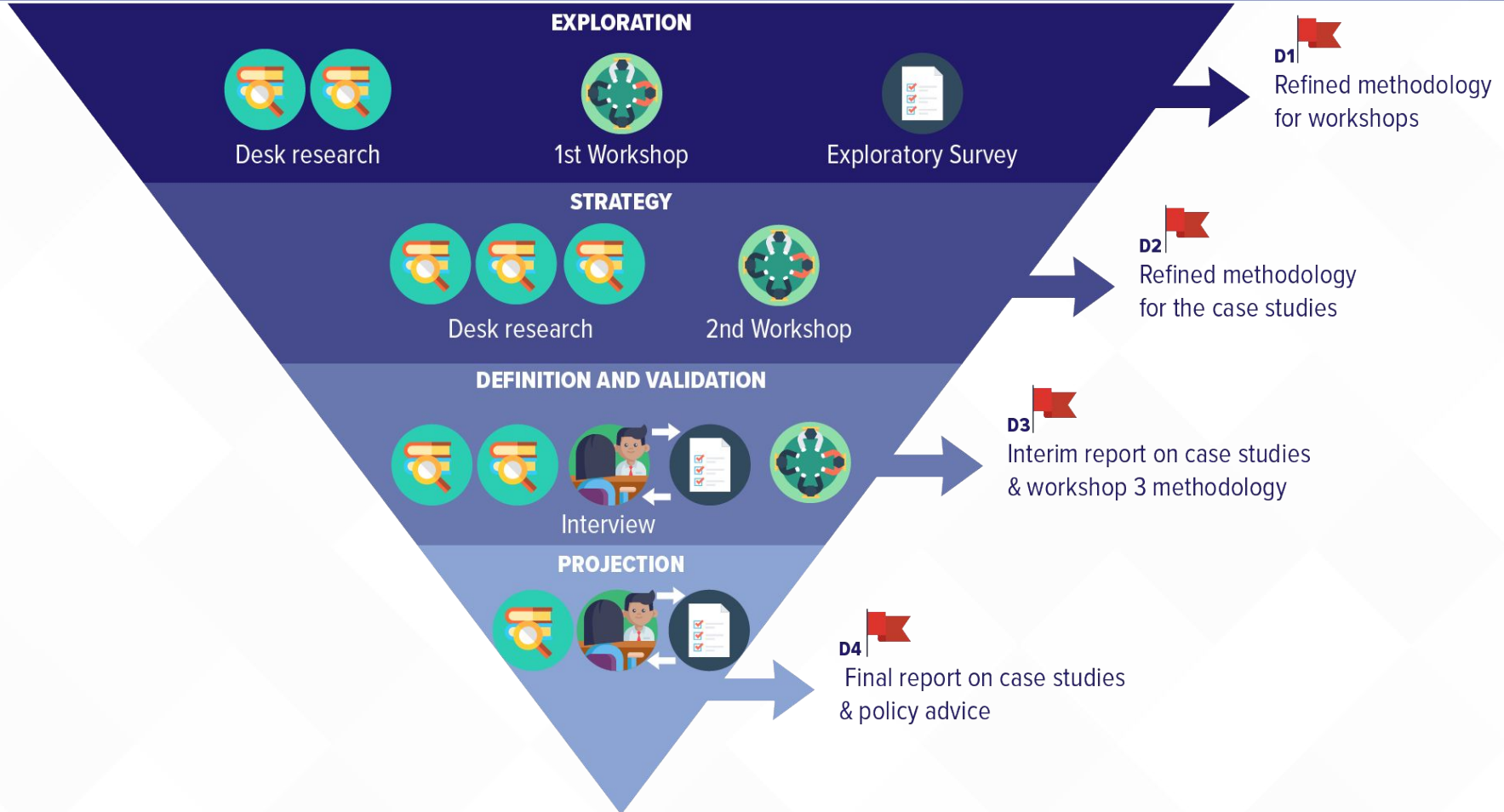
4. **Characterise data availability and define roadmaps for improvement in the case studies:**
  - a. Identify the **key actors and data holders**
  - b. Characterise **available information systems, data sources and repositories in the case studies**
  - c. Assess the **coverage of the case studies'** S3 R&I activities and results **in international open sources**

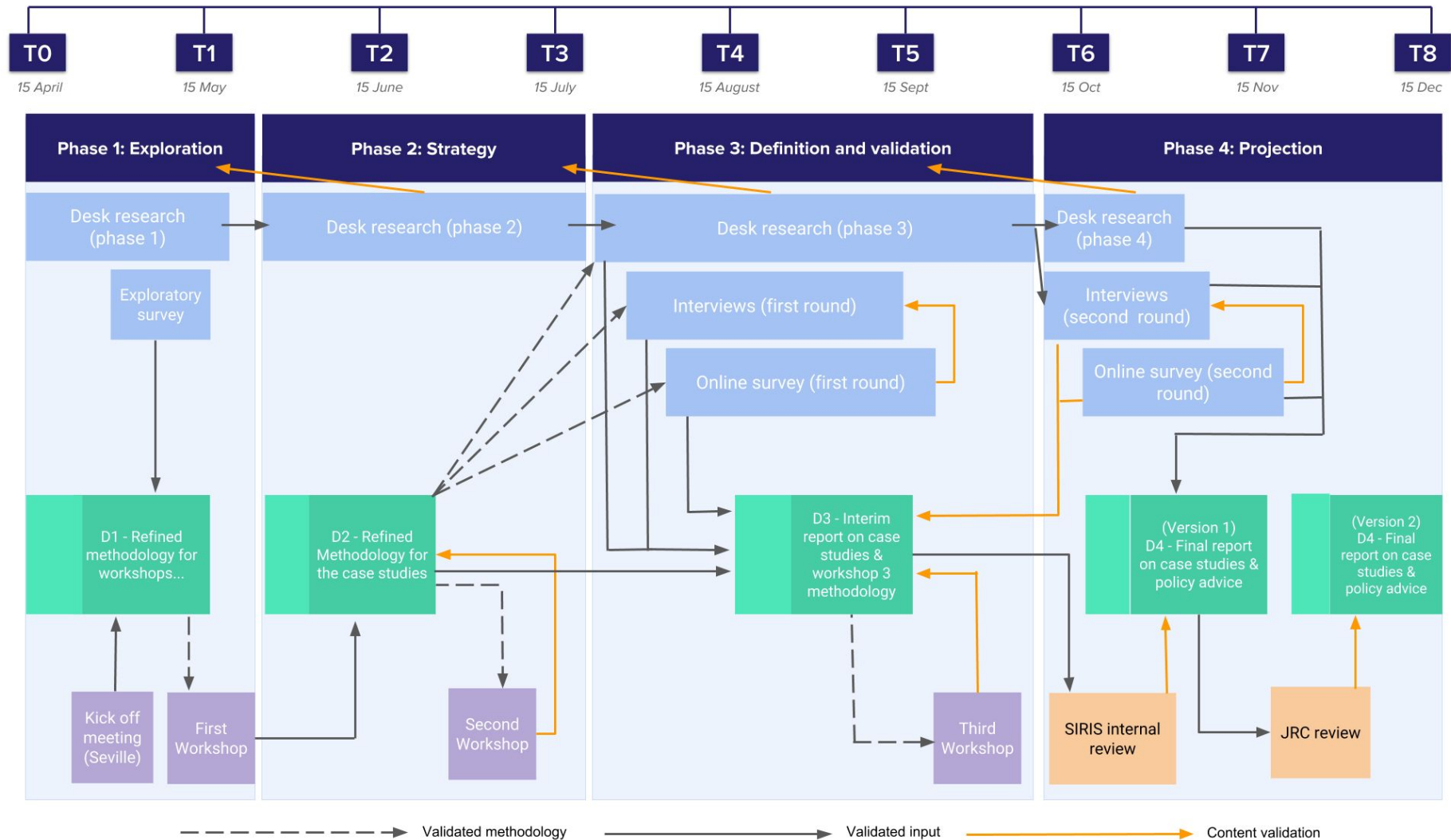
Additionally, at the EU level there are **transversal needs and opportunities in S3 monitoring that can be supported by open data, science and innovation principles, infrastructures and initiatives.**

- **Benchmarking across regions and priorities**
- **Supporting inter-regional collaboration**
- **Providing common policy recommendations, standards and data**
- **Facilitating aggregate S3 monitoring and evaluation at the EU level**

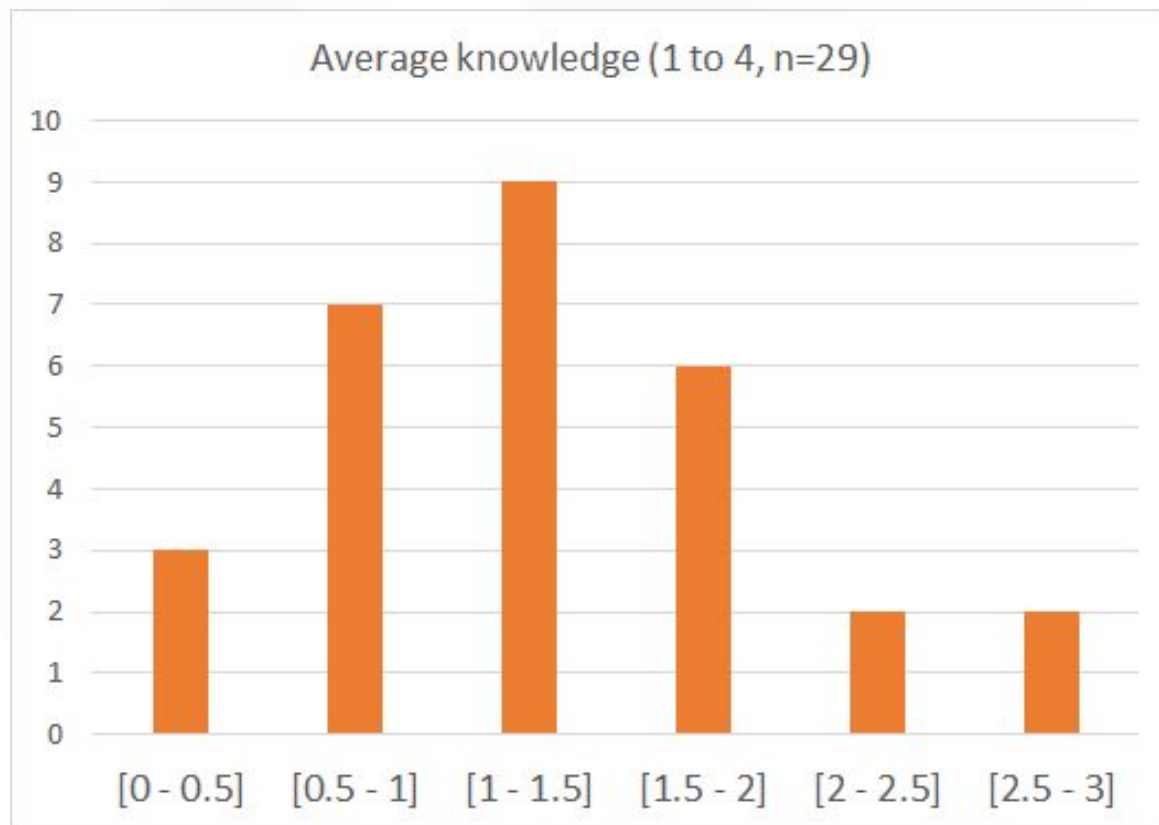
---

# **Project methodology, survey results and Workshop 1 objectives**



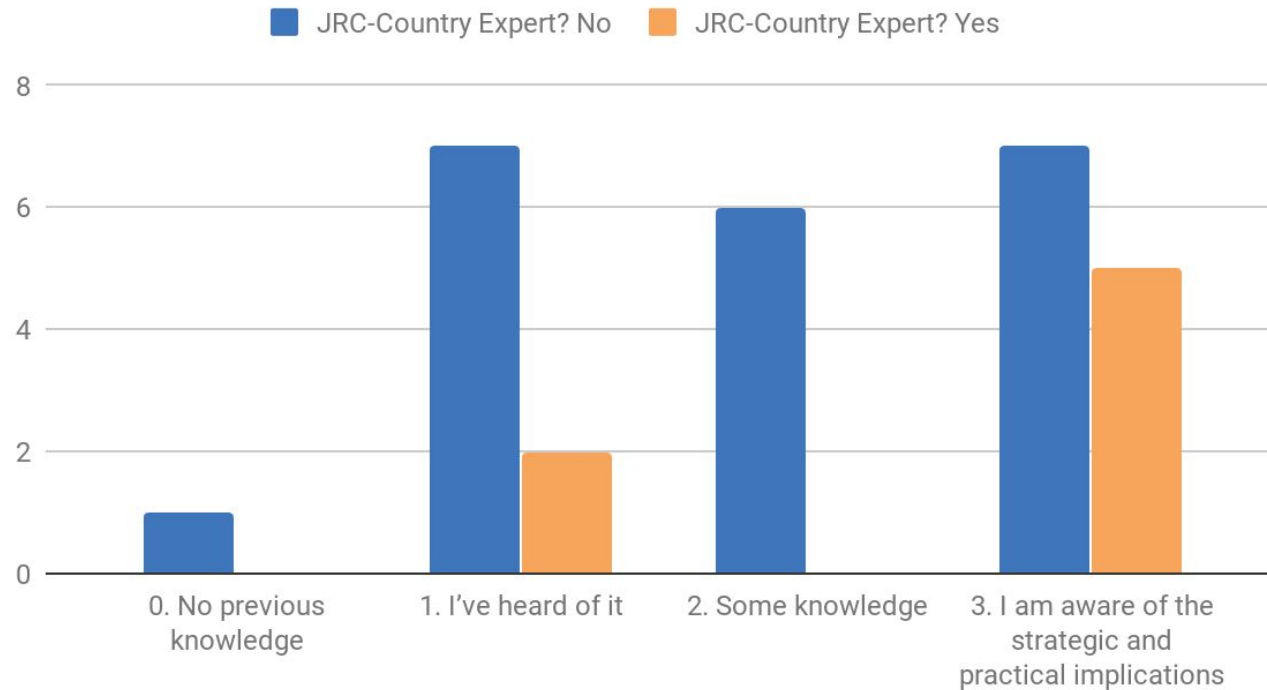


What is your knowledge/level of awareness of the ODSI concepts and international initiatives?

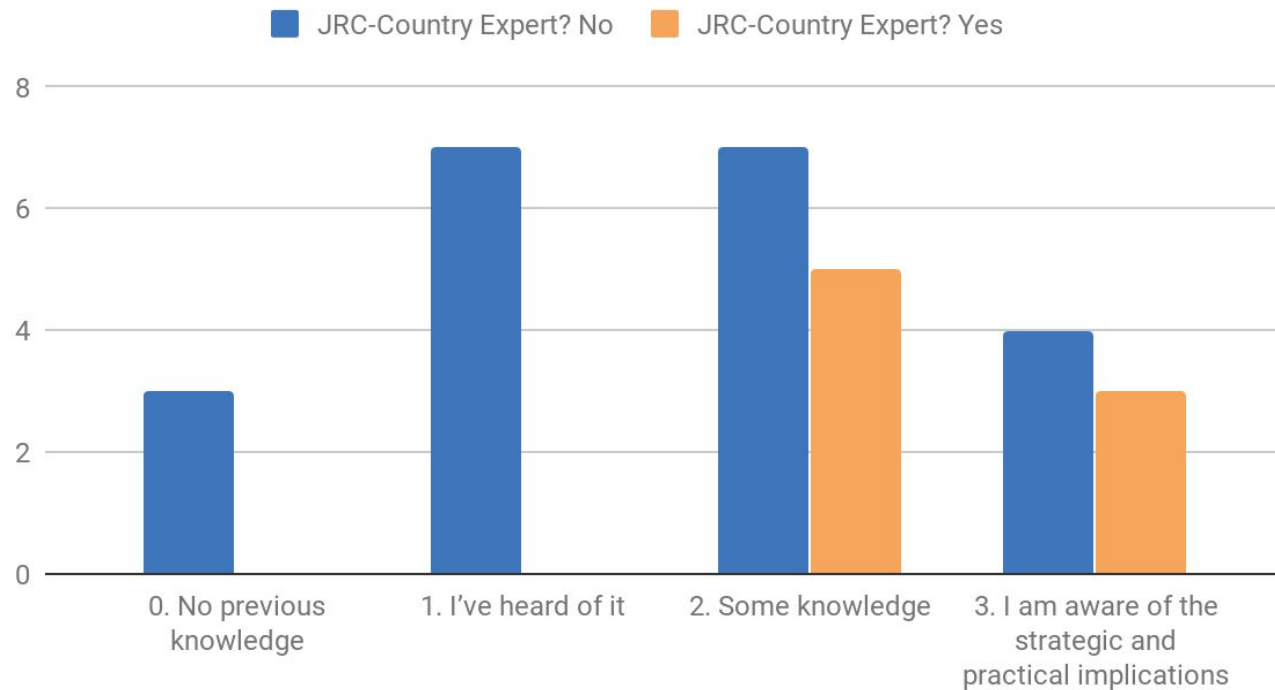




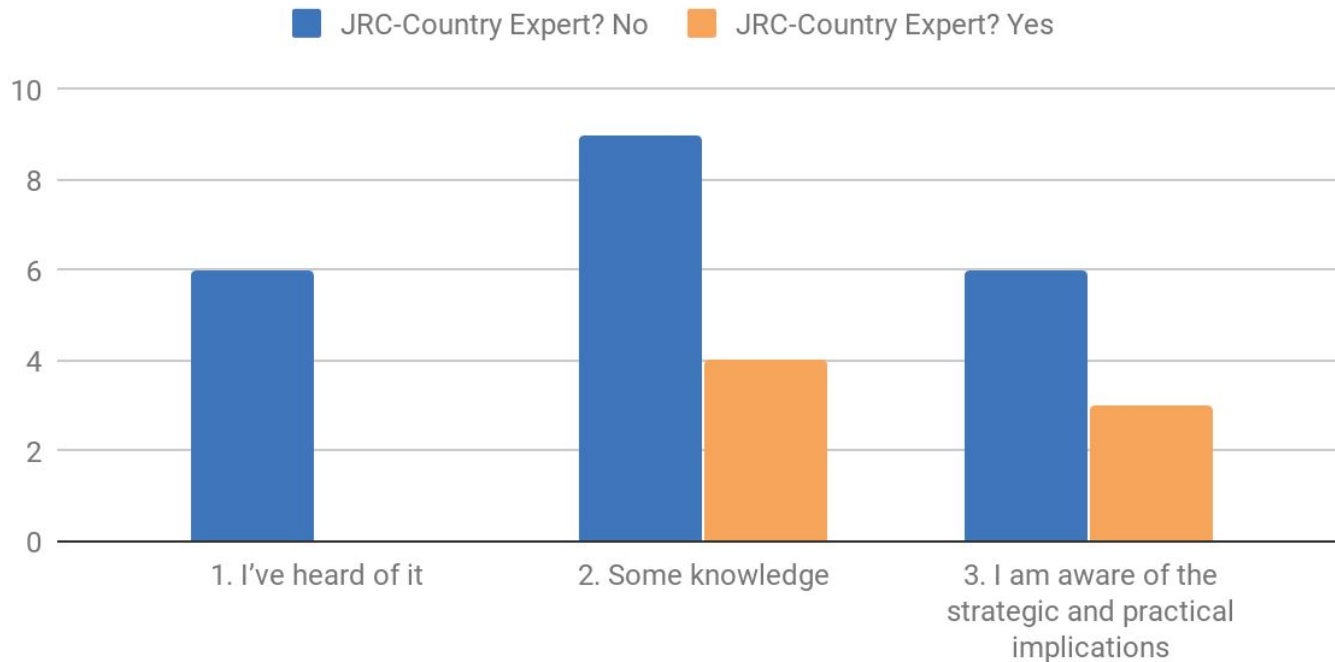
## What is your knowledge of the concept of Open Innovation?





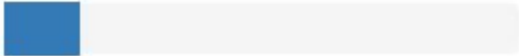
## What is your knowledge of the concept of Open Science?



## What is your knowledge of the concept of Open Government Data?



**8. Last year, we distributed a Survey on your RIS3 experience, which included a question regarding the typologies of indicators included in your monitoring system. We would like to ask about two additional types of indicators that were not covered in the previous survey, in particular: do you use data of the following types for your S3 monitoring?**

		Answers	Ratio
Indicators and data from regional actors' participation in national RDI calls		20	71.43 %
Databases or repositories of output documents of science and innovation activities (such as publications, patents or clinical trials)		16	57.14 %
No Answer		4	14.29 %

## Expectations of the participants

- [9] Good practices and examples of ODSI repositories and initiatives (useful for S3 monitoring) [interest in other countries initiatives]
- [8] Theoretical knowledge on ODSI frameworks
- [6] Improving S3 monitoring and evaluation
- [2] Setting-up routines for opening up data sources and making them available to the public
- [2] Setting-up routines for regionalisation of data collected at the national level & To sensitise those responsible at the national level so that information to the regions reaches me more fluidly (and vice versa)

1. To acquire **a basic common ground** about open data , open science and innovation and national/regional S3 monitoring strategies across the case studies regions and states as well as EU-wide.
2. To establish **coordination** with the relevant representatives from the case-study countries/regions as well as country-experts.
3. To use S3 and the state of OSDI as an entry point to understand **broader structural issues** regarding mandate, coordination, technology/infrastructure, access, budget and skills in the case studies

- ❑ Participants are expected to express their personal view
- ❑ Pending questions will be noted and further follow-up will be provided.
- ❑ To ensure the adequate development of the workshop, the facilitators will moderate speaking times and turns when necessary.

---

**Open government data**

**Open science**

**Open innovation**



**“Open data is data that anyone can access, use and share.** Governments, businesses and individuals can use open data to bring about social, economic and environmental benefits.

Open data becomes usable when **made available in a common, machine-readable format.**

**Open data must be licensed.** Its licence must permit people to use the data in any way they want, including transforming, combining and sharing it with others, even commercially.”

European Data Portal / Open Data Institute

<https://www.europeandataportal.eu/elearning/en/module1>

**“Open Government Data (OGD) is a philosophy - and increasingly a set of policies - that promotes transparency, accountability and value creation by making government data available to all”.**

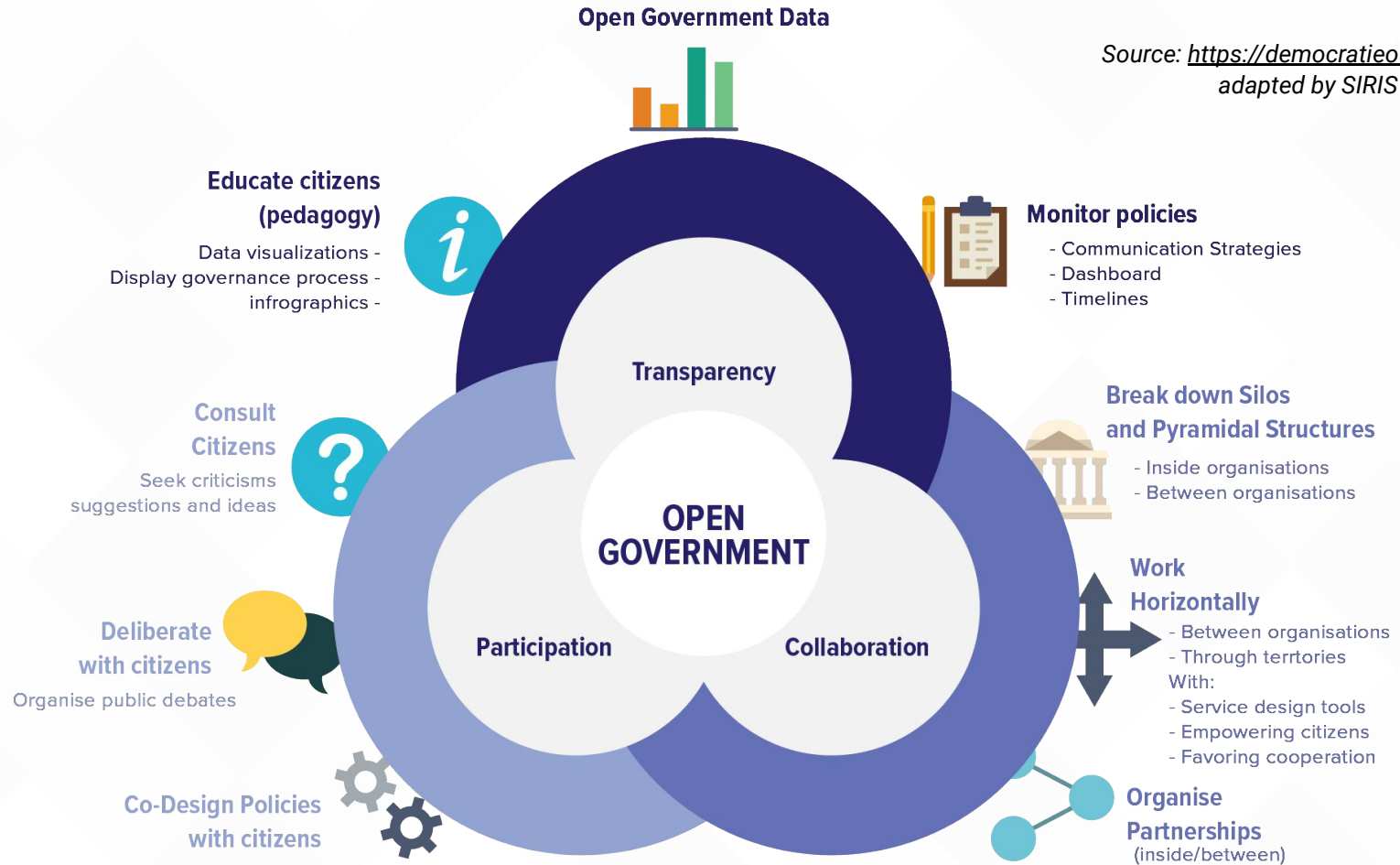
OECD

<http://www.oecd.org/gov/digital-government/open-government-data.htm>

“The European Commission funds the [European Data Portal](#) [...] a **pan-European repository of public sector information open for re-use in the EU**. This portal also offers a **training centre** on how to re-use open data and a database of **success stories** from European and international **re-users**”

European Commission

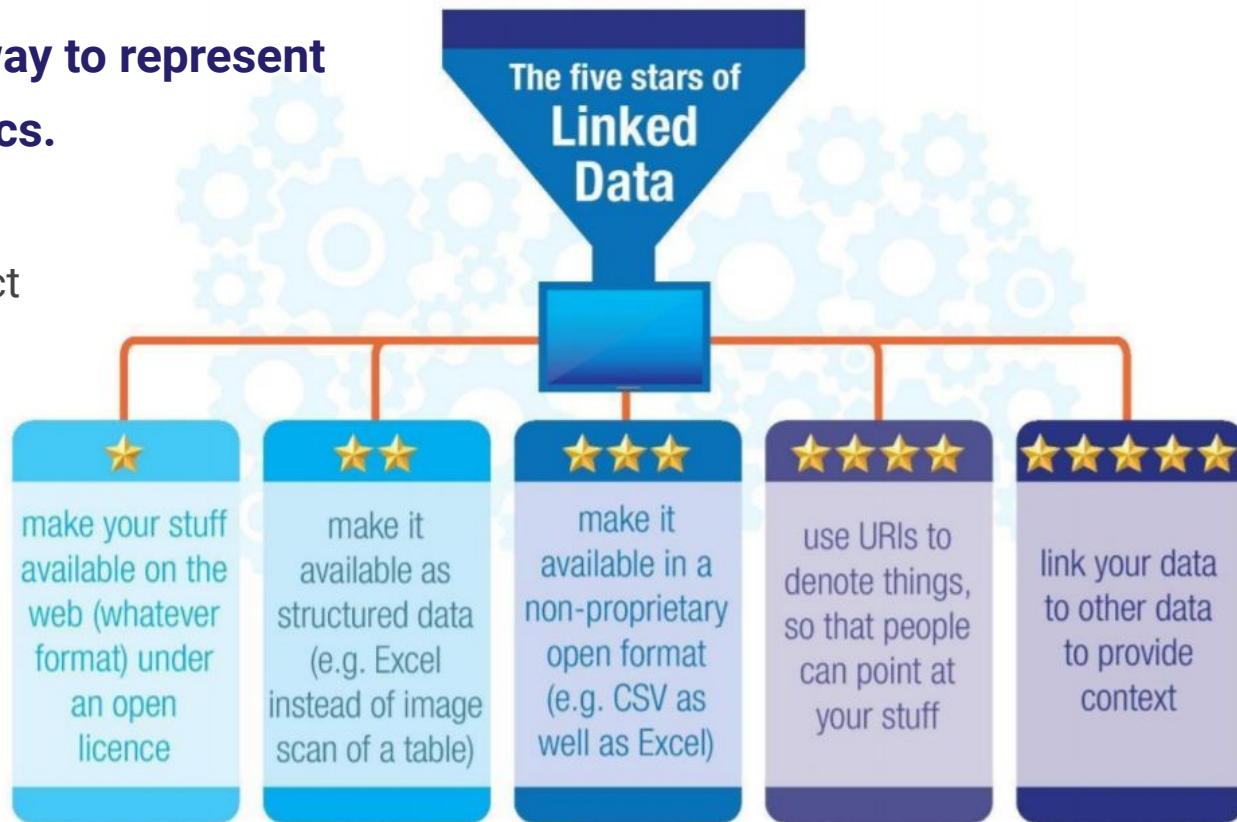
<https://ec.europa.eu/digital-single-market/en/open-data>



**“Linked data is a standard way to represent data on a wide range of topics.**

Publishing linked data makes it easier for developers to connect information from different sources, resulting in new and innovative applications.”

<http://data.europa.eu/euodp/en/linked-data>



“Open Science represents a new approach to the **scientific process based on cooperative work and new ways of diffusing knowledge** by using digital technologies and new collaborative tools”.

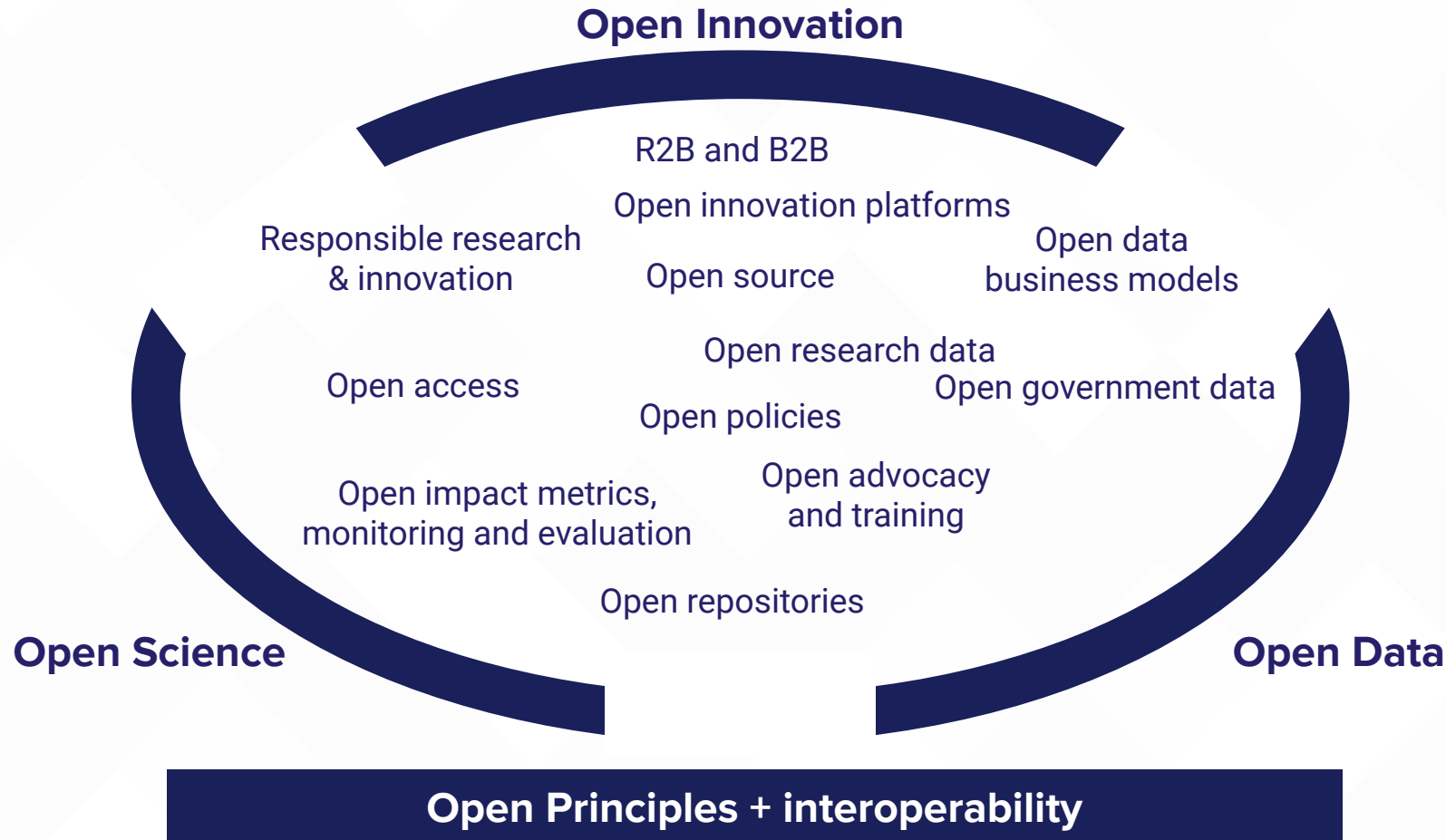
Open Innovation, Open Science, Open to the World

European Commission, 2016



“The basic premise of Open Innovation is to **open up the innovation process to all active players so that knowledge can circulate more freely and be transformed into products and services** that create new markets, fostering a stronger culture of entrepreneurship.”.

Open Innovation, Open Science, Open to the World  
European Commission, 2016





**“[...] interoperability is the ability of organisations to interact towards mutually beneficial goals**, involving the sharing of information and knowledge between these organisations”:

### **New European Interoperability Framework**

European Commission, 2017



**“Interoperability is the ability of computer systems or software to exchange and make use of information”**

“Interoperability is the ability of computer systems or software to exchange and make use of information”

Organisation
ARC Consulting EOOD
Bucharest-Ilfov Regional Development Agency
Bulgarian Small and Medium Enterprises Promotion Agency (BSMEPA)
Comlutense University of Madrid
Foundation FundecytPCTEX
FUNDECYT-PCTEX
General Secretariat for Research and Technology
Helsinki-Uusimaa Regional Council
Individual person name
Ingenio (CSIC-UPV), Universitat Politecnica de Valencia
Managing Authority of the OP of REMTh
SIRIS Academic
SIRIS Academic SL
SOUTH MUNTENIA REGIONAL DEVELOPMENT AGENCY
SOUTH WEST OLTENIA REGIONAL DEVELOPMENT AGENCY
SVILUPPO CAMPANIA S.P.A
Sviluppo Campania S.p.A.

Examples of useful **standards / metadata repositories**:

- **Organisations**: W3C Organization Ontology / ROR community
- **People (researchers)**: FOAF / ORCID
- **Grants**: 360° giving (UK) / *Report-WorldReport* (NIH)
- **Research information systems**: CERIF - Maintained by EuroCRIS and supported by the EC
- **Statistical Data and Metadata** eXchange (SDMX): sponsored by seven institutions (the BIS, the ECB, Eurostat, the IMF, the OECD, the UN and the World Bank)
- ...

At the regional level, it is important to be aware, use, and if possible, have stakeholders present in these open international initiatives

Source: <http://grantnav.threesixtygiving.org/funders>

## Funders

[↓ .CSV](#)
[↓ .JSON](#)

Search

1 to 16 of 100

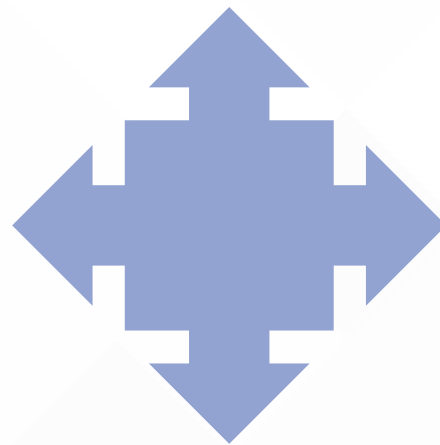
Funder	Grants	Total	Average	Largest	Smallest
<a href="#">The Big Lottery Fund</a>	202851	£ 9,038,784,970	£ 44,558	£ 214,340,846	£ 1
<a href="#">The Wellcome Trust</a>	15113	£ 6,505,268,298	£ 430,441	£ 50,000,000	£ 0
<a href="#">Department for Transport</a>	2577	£ 3,748,657,390	£ 1,454,659	£ 1,418,364,000	£ 0
<a href="#">Sport England</a>	15905	£ 2,466,855,052	£ 155,099	£ 87,000,000	£ 0
<a href="#">Gatsby Charitable Foundation</a>	253	£ 585,503,010	£ 2,314,241	£ 79,823,428	£ 11,657
<a href="#">Greater London Authority</a>	890	£ 495,809,670	£ 557,089	£ 75,000,000	£ 0
<a href="#">Esmée Fairbairn Foundation</a>	3358	£ 395,050,816	£ 117,644	£ 3,941,914	£ 1,700
<a href="#">Comic Relief</a>	998	£ 261,411,631	£ 261,935	£ 8,000,000	£ 1,000
<a href="#">Guy's and St Thomas' Charity</a>	995	£ 232,603,843	£ 233,772	£ 25,000,000	£ 102
<a href="#">Northern Rock Foundation</a>	4331	£ 219,331,829	£ 50,642	£ 3,000,000	£ 65
<a href="#">The Henry Smith Charity</a>	3871	£ 183,431,164	£ 47,385	£ 335,100	£ 125
<a href="#">Local Trust</a>	150	£ 172,887,500	£ 1,152,583	£ 1,159,250	£ 1,149,250
<a href="#">Ministry of Justice</a>	774	£ 172,329,343	£ 222,647	£ 11,266,182	£ 800

## **S3 implementation and monitoring can also contribute to open data, open science and open innovation**

- **Open principles and processes:**
  - **promoting openness of project activities and results**
  - **data standards and infrastructure**
    - **publishing as open data**
  - **stakeholder engagement and collaboration (RRI)**
  - **monitoring and evaluation**
- **Connecting S3 policy open data to open S&I repositories, establishing a common framework for micro-level project and policy monitoring and evaluation**

## Smart specialisation

**Open science**



**Open innovation**

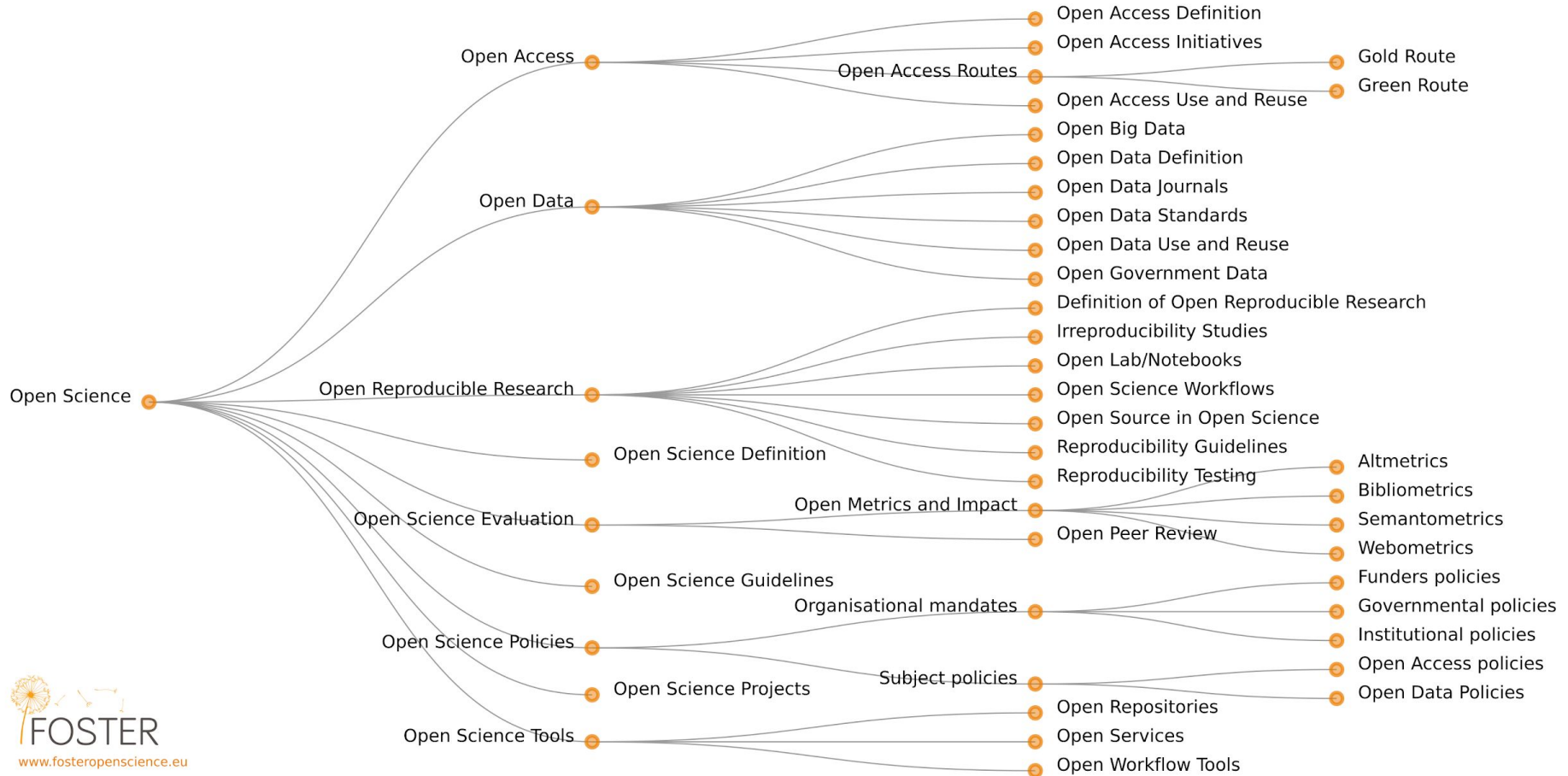
**Open data**

**Open principles + interoperability**

---

# **Topic 1: Open Data, Science and Innovation frameworks and principles. Criticisms and issues that limit or may challenge the advancement of ODSI-S3**







## Background

Paywalls are constraining the flow of science and ideas, and limiting the outreach of research onto civic society

## Plan-S

an initiative supported by research funding organisations, the EC and the ERC

## Objectives

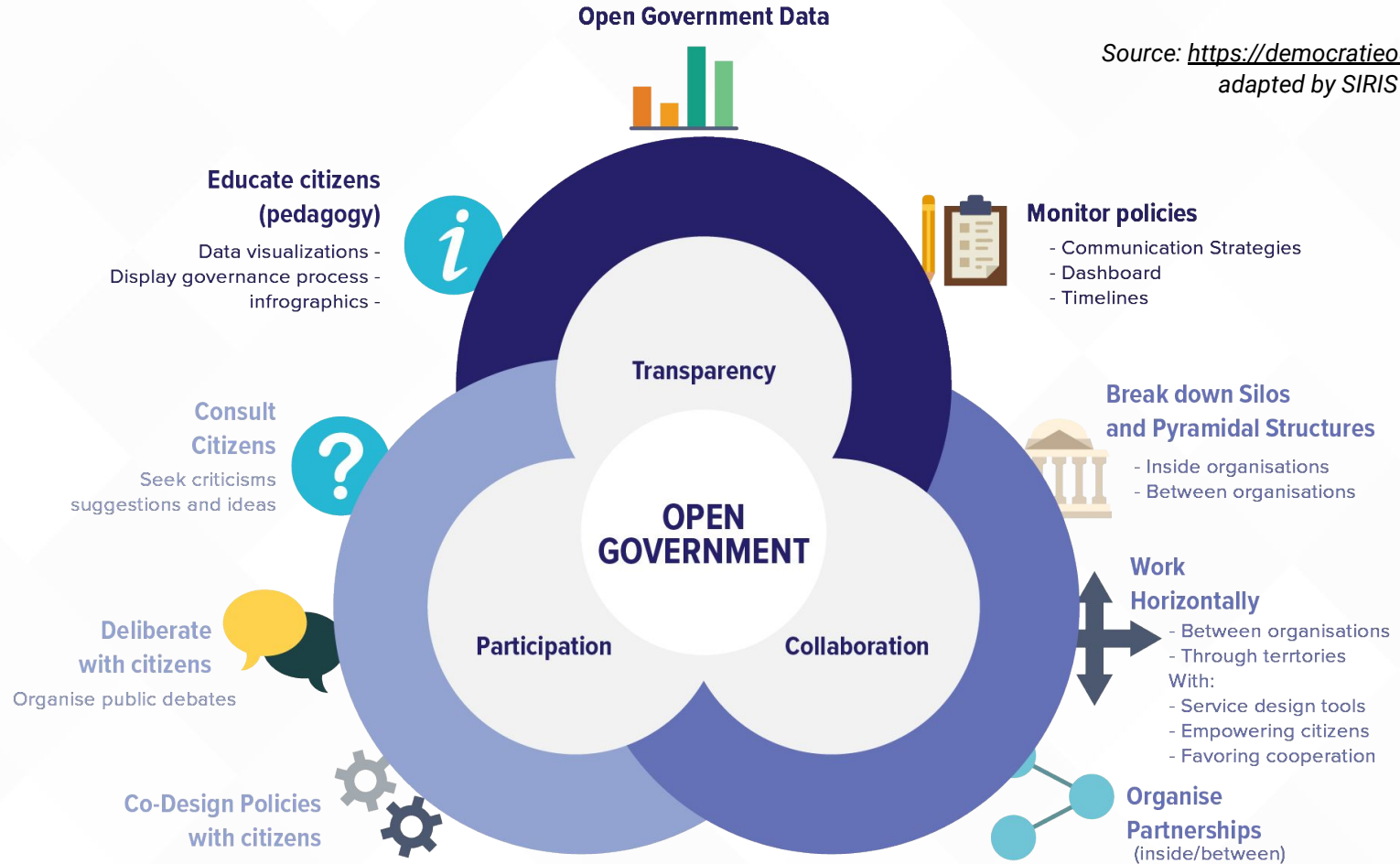
enforcing full and immediate Open Access of research publications produced by research funded by participating organisations

To be **findable**: data and supplementary materials should have sufficiently rich metadata and a unique and persistent identifier.

To be **accessible**, metadata and data must be understandable to humans and machines and data must be deposited in a trusted repository.

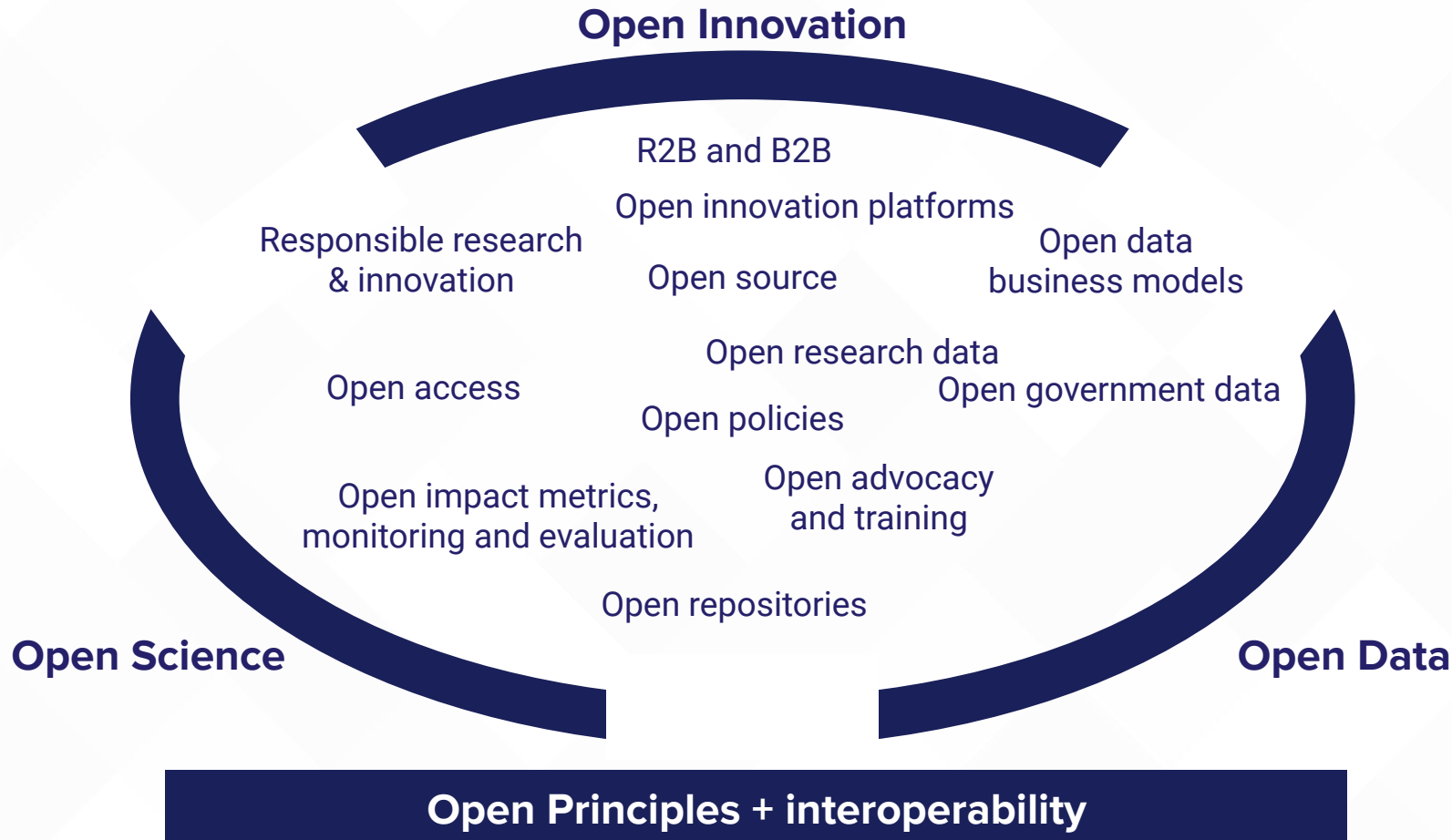
To be **interoperable**, data must use a formal, accessible, shared, and broadly applicable language for knowledge representation.

To be **reusable**, data and content must have a clear usage licenses and provide accurate information on provenance.



Source: <https://democratieouverte.org/>  
adapted by SIRIS Academic.

1. **Complete**
2. **Primary**
3. **Timely**
4. **Accessible**
5. **Machine processable**
6. **Non-discriminatory**
7. **Non-proprietary**
8. **License-free**



1. **Centralisation - one size fits all vs. Decentralisation - case by case**
2. **Absorptive capacity**
  - a. **Public sector**
  - b. **Private sector**
3. **Open knowledge for whom**
  - **public cost, private benefit?**
  - **multinationals can afford science-business interface profiles**
4. **Other? → LEARNING**

---

## **Topic 2: Global and EU ODSI initiatives, infrastructures and data sources**



## Topics to be discussed

1. EU and global infrastructures and initiatives
2. More than data repositories
3. Open discussion: Current challenges, needs and limitations

Scope	Value for S3 monitoring	Eg. of open sources
<b>International patents</b>	From EPAB, it is possible to extract inventors and applicants/assignees, collaborations, textual content and taxonomies (i.e. patent classes), amongst other information.	✓ <b>EPO's EPAB:</b> European patents applications and specifications database - European Patent Office ✓ <b>OECD IP Data:</b> Intellectual property (IP) statistics and analysis.
<b>European Trademarks and Community Designs</b>	<i>EU</i> trade mark and the registered Community designs.	✓ <b>EUIPO:</b> The European Union Intellectual Property Office.
<b>Clinical trials</b>	These kind of data sources inform about the uses of research results in several application areas. In the case of the given examples, clinical trials bring some valuable insights on the research impact on the health systems.	✓ <b>ClinicalTrials.gov</b> ✓ <b>OpenTrials</b> ✓ <b>EudraCT</b>

Scope	Value for S3 monitoring	Eg. of open sources
<b>R&amp;I projects funded by the EC Framework Programmes</b>	From these sources it is possible to extract the partners, collaborations, textual content, taxonomies and funding volume of projects in the “lagging regions”, amongst other information.	✓ <b>CORDIS</b> ✓ <b>H2020 dashboard</b>
<b>SME R&amp;I Instruments</b>	The sources inform about innovative processes carried out by Small and Medium-sized Enterprises. From COSME data hub, it is possible to obtain single initiatives and its actors.	✓ <b>COSME data hub</b>
<b>Interreg R&amp;I projects</b>	The European problem INTERREG finances interregional research and innovation projects through their Axis 1, which typically involve local authorities and stakeholders less prone to participate and have visibility in other policy instrument and sources.	✓ <b>Keep</b>
<b>Cultural and creative projects</b>	Cross-border cooperation projects between cultural and creative organisations within the EU and beyond, a relevant sector in many S3 strategies which is <b>frequently relatively absent of traditional science and innovation instruments and sources</b> .	✓ <b>Creative Europe</b> - EC's Programme for support the culture and audiovisual sectors.

Scope	Value for S3 monitoring	Eg. of open sources
<b>Publications, research data and other results of scientific production</b>	These data sources inform of the advancement of scientific knowledge production and dissemination. They contain information on publications, authors, research institutions, collaboration network, citation, etc.	<ul style="list-style-type: none"> <li>✓ <b>Crossref</b> (publications)</li> <li>✓ <b>Open citations</b> (publication citations)</li> <li>✓ <b>OpenAire</b> (research products and grants/projects)</li> <li>✓ <b>Zenodo</b> (research products and communications)</li> </ul>
<b>Science, technology and innovation policies</b>	These data sources permit to understand the regional policy background on science, technology and innovation by exposing the applied policy instruments (e.g. STIP Compas)	✓ <b>OECD STIP Compass</b>
<b>Business demography and financial information</b>	Open data on the existing companies, theirs main activities and networks in the region.	✓ <b>OpenCorporates</b>

## Not only data repositories but also Open Science initiatives

### Relevant examples

#### European Open Science Cloud (EOSC)

“The EOSC is expected to grow into a **federated ecosystem of organisations and infrastructures from different countries and communities.**”

“EOSC is a vision for a **federated, globally accessible, multidisciplinary environment** where researchers, innovators, companies and citizens can **publish, find, use and reuse each other's data, tools, publications and other outputs** for research, innovation and educational purposes.”

#### OpenAire

“OpenAIRE’s mission is to **establish, maintain and operate an open and sustainable scholarly communication infrastructure** and provide the necessary **services, resources and network** for supporting a common European e-science environment.”

## OpenAire - Current actions

### What OpenAire does?

<b>Align policies</b>	OA created a network of 34 National Open Access Desks (NOADs) operates a European Helpdesk supporting a <b>coordinated transition to Open Science</b> .
<b>Provide open science services</b>	OA provides <b>interoperability services that connect research</b> and enable researchers, content providers, funders and research administrators to easily adopt open science.
<b>Link research</b>	OA <b>links research outcomes</b> (e.g., publications, data, software) <b>to their creators</b> (e.g., researchers, institutions, funders), enabling <b>discoverability, transparency, reproducibility and quality-assurance of research</b> .
<b>Monitor (open) science</b>	We build the European Research Information system that encompasses all research and enables <b>ready-made reporting, monitoring and analysis</b> .
<b>Other</b>	<b>Train for open science</b> , Connecting Europe to the global open research environment and <b>Facilitate Open Innovation</b>

## **Regional S3 monitoring**

- 1. Any questions or comments on the list of ODSI initiatives and infrastructures?**
- 2. Any supranational ODSI infrastructure or initiative missing? Any scope (activity, result, type of data) missing?**
- 3. Which limitations might restrict your usage of data from EU or global ODSI initiatives?**

## Limitations and considerations of the use of open data and open science sources for S3 monitoring, particularly in lagging regions:

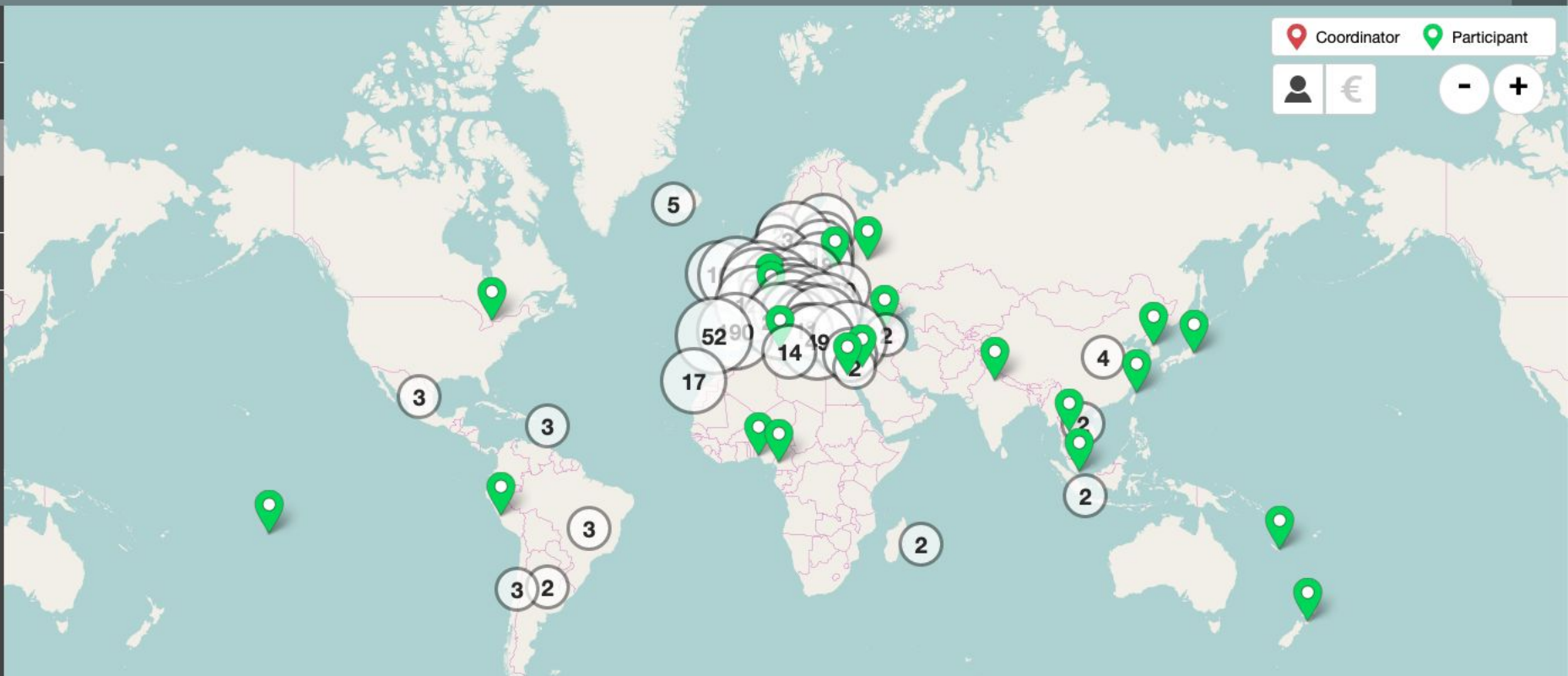
1. **Data representation bias** against lower-technology sectors, traditional sectors, non-technological innovation and **unrecorded information flows**
2. **Uneven representation of institutional typologies and missions**, overrepresentation of academic actors and underrepresentation of companies, NGOs, governments, etc. developing innovation or applying technology
3. **Bias in the coverage** of scientific publications in **peripheral geographies**, local languages and some disciplines/journals
4. **Low number of records** hindering a deeper characterisation of some regional case studies or S3 specialisation domains



## **Engaging in EU and global ODSI initiatives**

- 1. Are you aware if your region or country takes part in Global and/or EU ODSI initiatives or infrastructures?**
- 2. How could we benefit from participating those initiatives?**

## COSME data hub



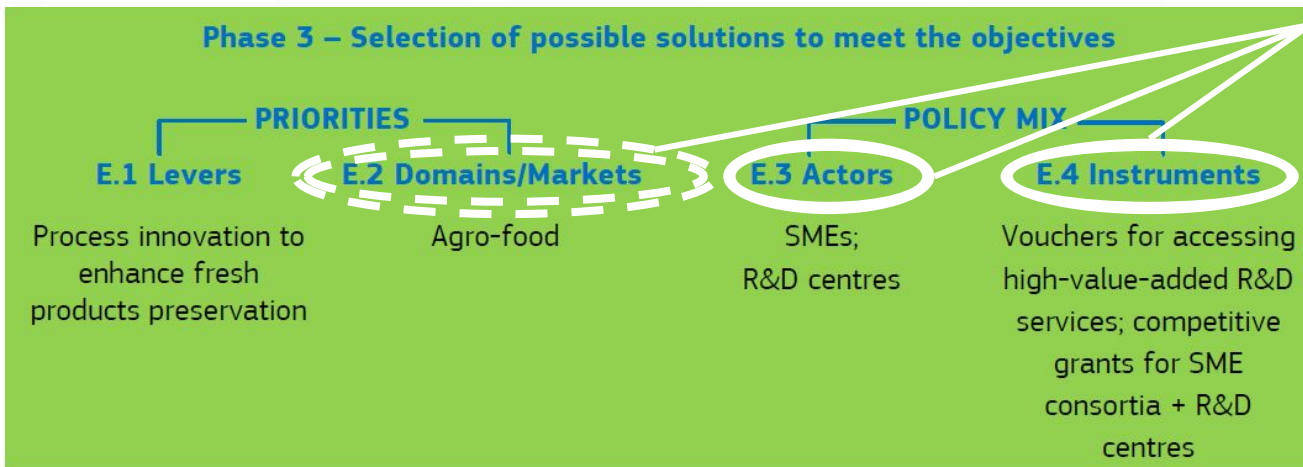
---

**Priorities, pressing issues and unsatisfied  
informational needs in national and regional S3  
monitoring**

## Phase 1 - Recognition of challenges and needs

## Phase 2 - Formulation of strategic objectives

What you can expect to find  
in external data sources



*Monitoring Mechanisms for Smart  
Specialisation Strategies*

*Carlo Gianelle and Alexander Kleibrink*

*S3 Policy Brief Series. 2015. European Commission*

“We understand advanced users may want to **download data from the STIP Compass database to conduct their own analysis**. The query builder allows you to download data from the STIP Compass database in the **following file formats: XML (machine-readable) and CSV (as a spreadsheet)**.”

Besides files, you can also generate **URLs** that can be used at a later time to download the latest data. These URLs **can also be used by other knowledge management systems** to automatically download the latest data on a continuous basis.

For further information on **how the data is structured**, you may refer to the [STIP Compass data model](#).”

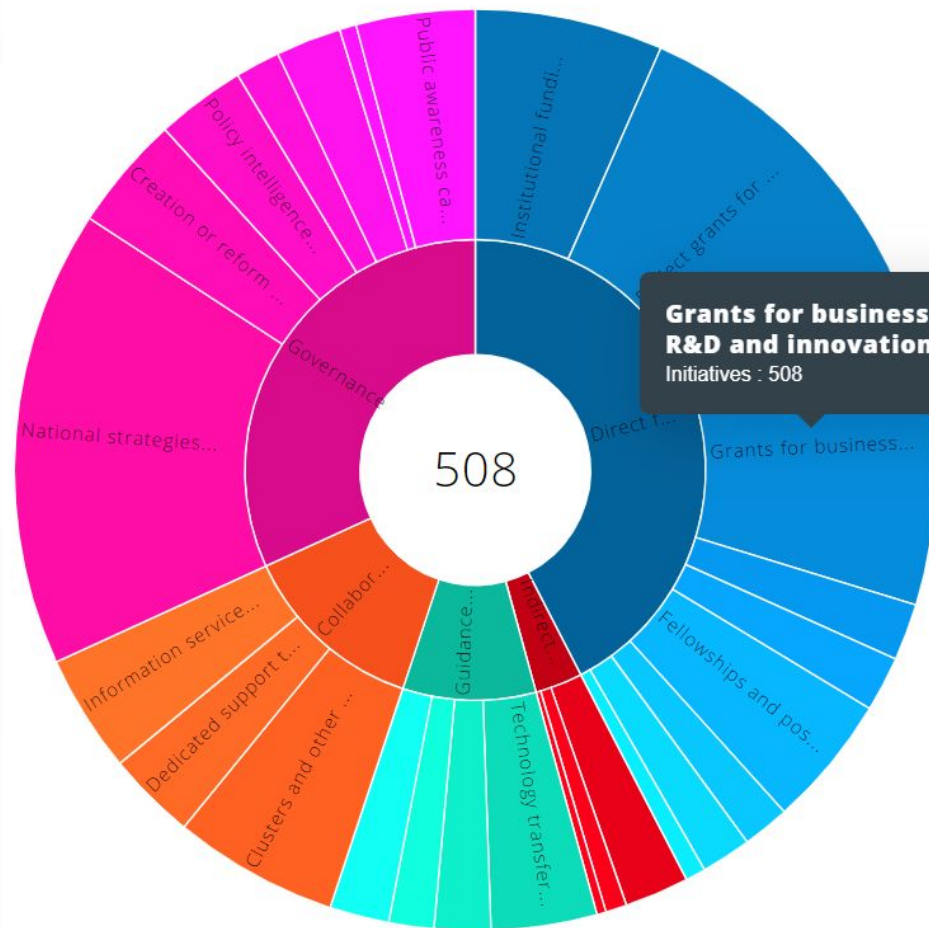
Direct financial support

Indirect financial support

Guidance, regulation and other incentives

Collaborative platforms and infrastructure

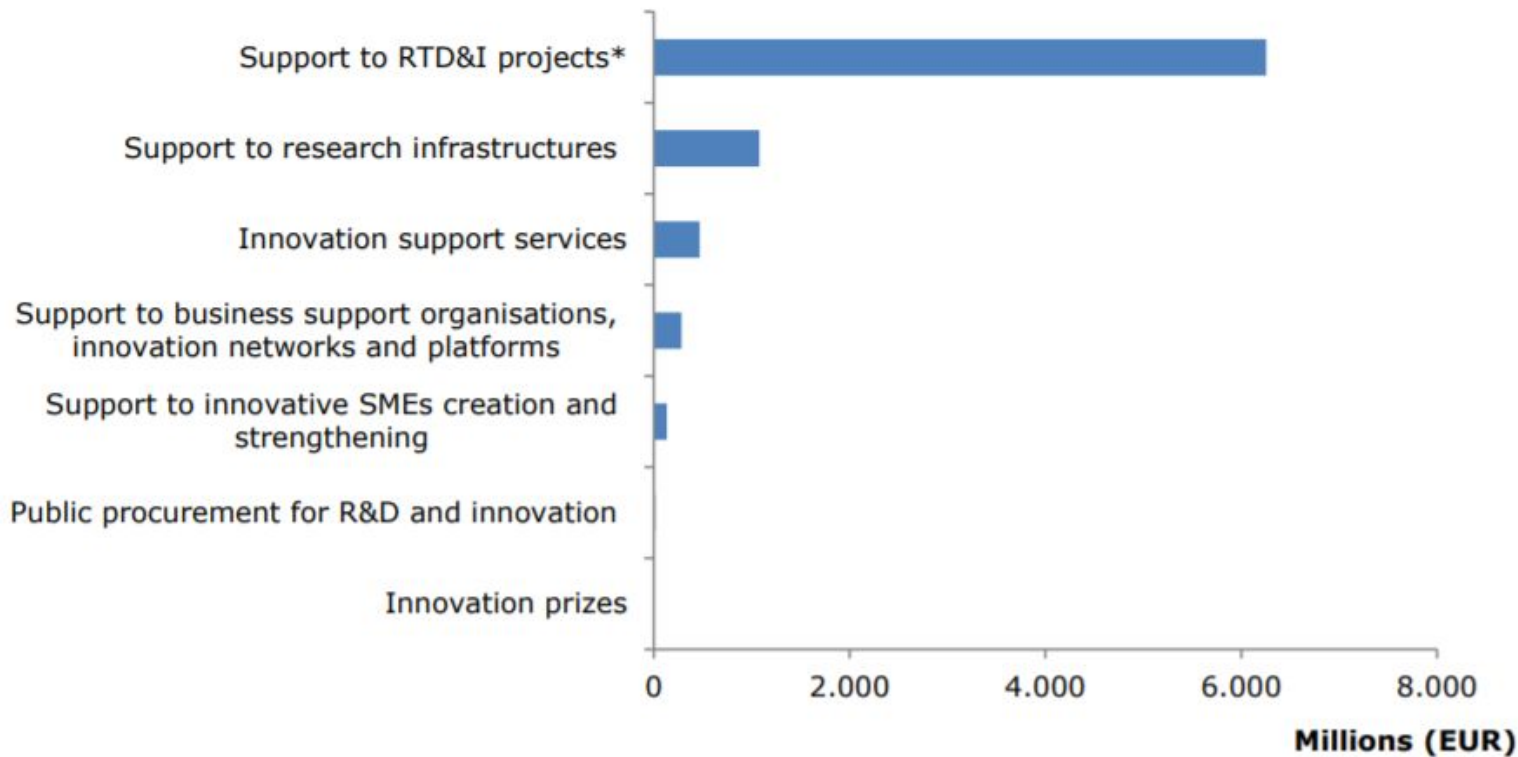
Governance



**Grants for business  
R&D and innovation**  
Initiatives : 508

*STIP Compass*

*OECD O.N.E Sight | The database is based on country responses to the European Commission-OECD Science, Technology and Innovation Policy Survey.*



**Direct financial support**

- Institutional (*basal*) funding for public research
- Project grants for public research
- Grants for business R&D and innovation
- Centres of excellence grants
- Procurement programmes for R&D and innovation
- Fellowships and postgraduate loans and scholarships
- Loans and credits for innovation in firms
- Equity financing
- Innovation vouchers

**Indirect financial support**

- Corporate tax relief for R&D and innovation
- Tax relief for individuals supporting R&D and innovation
- Debt guarantees and risk sharing schemes

**Guidance, regulation and other incentives**

- Technology transfer and business advisory services
- Labour mobility regulation and incentives
- Intellectual property regulation and incentives
- Science and innovation challenges, prizes and awards

**Collaborative platforms and infrastructure**

- Clusters and other networking and collaborative platforms
- Dedicated support to new research infrastructures
- Information services and databases

**Governance**

- National strategies, agendas and plans
- Creation or reform of governance structure or public body
- Policy intelligence (e.g. evaluations, reviews and forecasts)
- Formal consultation of stakeholders or experts
- Horizontal STI coordination bodies
- Standards and certification for tech. development and adoption
- Public awareness campaigns and other outreach activities



## **Limitations and considerations of the use of open data and open science sources for S3 monitoring, particularly in lagging regions:**

- 1. Data representation bias** against lower-technology sectors, traditional sectors, non-technological innovation and **unrecorded information flows**
- 2. Uneven representation of institutional typologies and missions**, overrepresentation of academic actors and underrepresentation of companies, NGOs, governments, etc., developing innovation or applying technology
- 3. Bias in the coverage** of scientific publications in **peripheral geographies**, local languages and some disciplines/journals
- 4. Low number of records** hindering a deeper characterisation of some regional case studies or S3 specialisation domains

“Main findings:

1. An open science system should be grounded in **a mix of expert judgement, quantitative and qualitative measures**
2. **Transparency and accuracy are crucial**
3. **Make better use of existing metrics** for open science
4. Next generation metrics should be underpinned by **an open, transparent and linked data infrastructure.**
5. **Measure what matters:** the next generation of metrics should begin with those qualities and impacts that European societies most value and need indices for, rather than those which are most easily collected and measured.”

## 2. “Transparency and accuracy are crucial

- a. **Robustness:** basing metrics on the best possible data in terms of accuracy and scope;
- b. **Humility:** recognising that quantitative evaluation should support – but not supplant – qualitative, expert assessment;
- c. **Transparency:** keeping data collection and analytical processes open and transparent, so that those being evaluated can test and verify the results;
- d. **Diversity:** accounting for variation by field, and using a range of indicators to reflect and support a plurality of research and researcher career paths across the system;
- e. **Reflexivity:** recognising and anticipating the systemic and potential effects of indicators, and updating them in response.”

---

**Enric Fuster** - [enric.fuster@sirisacademic.com](mailto:enric.fuster@sirisacademic.com)

**Francesco Massucci** - [francesco.massucci@sirisacademic.com](mailto:francesco.massucci@sirisacademic.com)

**Arnau Quinquillà** - [arnau.quinquilla@sirisacademic.com](mailto:arnau.quinquilla@sirisacademic.com)

**SIRIS Academic** - <http://www.sirisacademic.com>

**Contact** - [info@sirisacademic.com](mailto:info@sirisacademic.com)

**Meet the team** - <http://www.sirisacademic.com/wb/team/>