



THE TRANSFORMATIONAL POTENTIAL OF DIGITAL SCIENCE AND INNOVATION POLICY

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OECD Digital Science and Innovation Policy and Governance Project (DSIP)

- The OECD “**Digital Science and Innovation Policy**” (DSIP) project, carried out under the aegis of the OECD Committee for Scientific and Technological Policy (CSTP), aims to allow policy-makers and researchers to make an informed assessment of the transformational potential and possible pitfalls of the use of digital tools and sources in science and innovation policy-making.
- Besides a few notable exceptions, the impact of digitalization on science and innovation policy has been barely studied, particularly in a comparative framework. Yet, there is considerable scope for international mutual learning on data sharing, disambiguation and analysis, common standards and data platforms





Digital Science and Innovation Policy (DSIP) initiatives

- **DSIP initiatives** refer to the adoption or implementation by public administrations, with responsibilities for science and innovation, of practices characterised by an intensive and novel use of digital technologies and/or data resources, with the aim of supporting the formulation of science and innovation policy or the delivery of public services in this area.





Structure of the final report

- **Chapter 1. Overview of DSIP**

Provides an introductory high-level overview of the DSIP landscape, introducing the main actors and their activities, and discussing the types of systems in use and under development, the reasons for their emergence, their significance today and in the future and the key trends and issues shaping developments.

- **Chapter 2. Meeting the interoperability challenge**

Provides an overview and analysis of the interoperability challenge, one of the main issues in delivering DSIP systems, and the roles that emerging standards can play

- **Chapter 3. DSIP and the future of research assessment**

Provides an overview of existing and future implications of DSIP for research assessment

- **Chapter 4. The private sector in DSIP**

Provides an account and assessment of the considerable roles played by the private sector in the DSIP space, focusing on the potential benefits and risks.

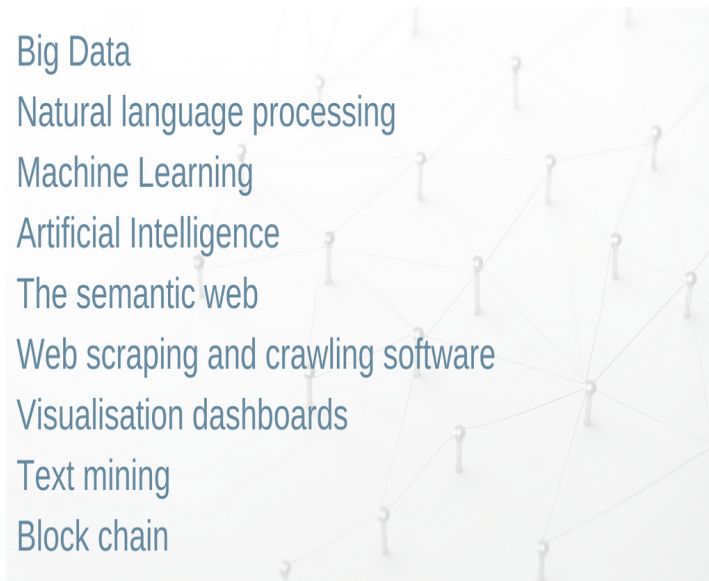


The final report will be published in the end of 2018.





Digital technologies and digital tools



- Digital technologies, e.g. Big Data and Artificial Intelligence, have a promise to support science and innovation policy through increasing verifiability and granularity of analysis of impacts ranging from research funding allocation to research commercialisation.
- Digital technologies can be used to identify inventions of high novelty, map linkages among research & innovation actors and find potential areas of technological breakthroughs (Gerken, 2012; Zhang et al, 2016; Peng et al, 2017; Yoo & Won, 2018);





Transformational potential of DSIP

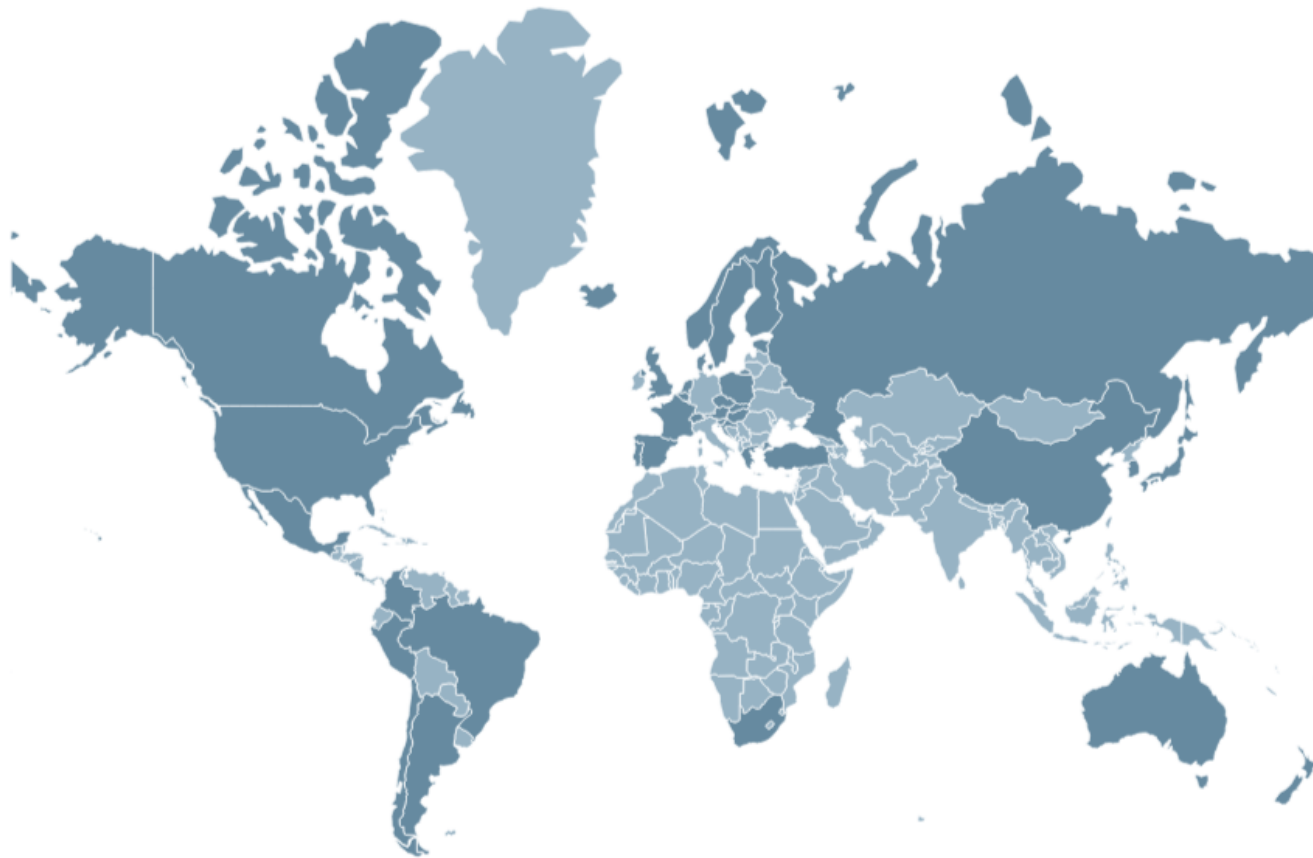
- Fostering of evidence-informed cultures in governments through provision of detailed analysis of granular impacts of science and innovation policy initiatives;
- Changes in how government agencies with responsibilities for science and innovation lead their operations and how they are organised;
- Changes in the relations among science and innovation policy actors.





Desk research

Desk research: identification of key issues, main actors, strategies and activities



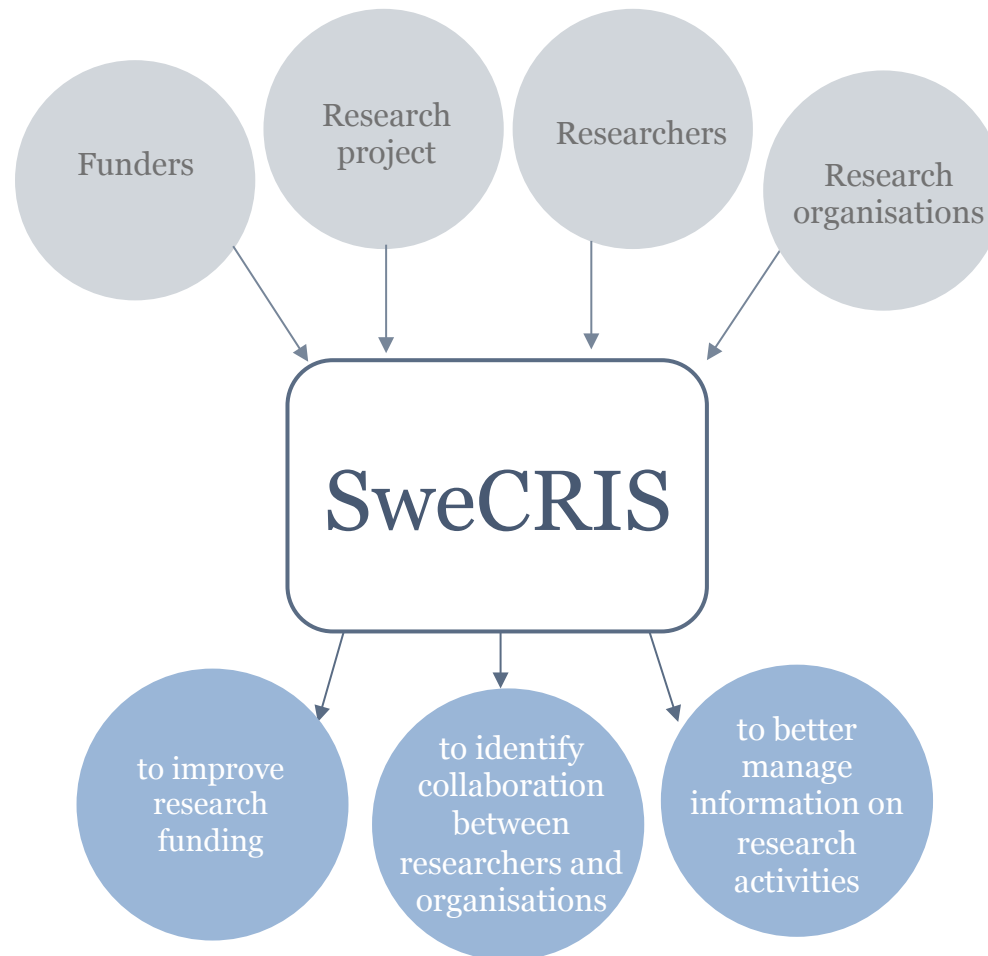
Mapping exercise: 64 DSIP initiatives from 34 countries





DSIP initiative in Sweden

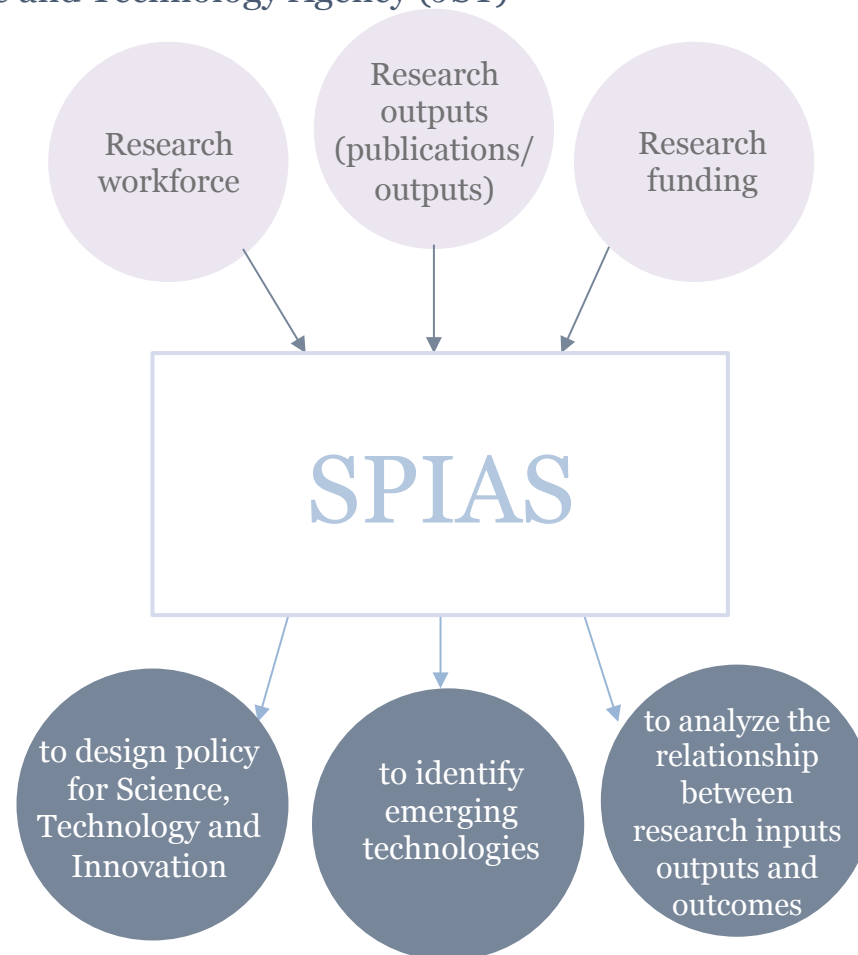
SweCRIS, a digital platform hosted by the Swedish Research Council





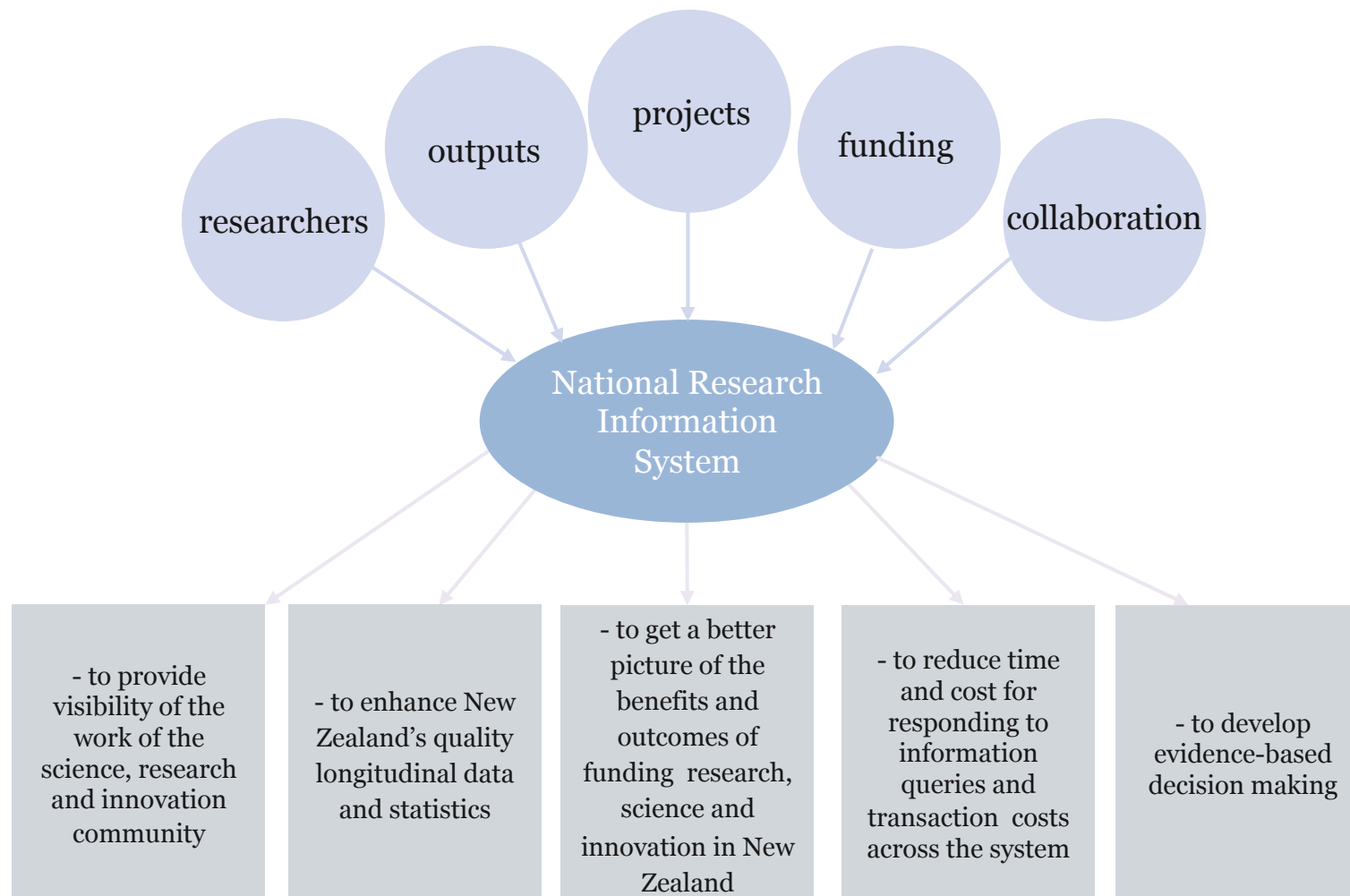
DSIP initiative in Japan

SPIAS (SciREX Policymaking Intelligent Assistant System), a digital system created in cooperation of the Ministry of Education, Culture, Sports, Science and Technology (MEXT), National Institute of Science and Technology policy (NISTEP), National Graduate Institute for Policy Studies (GRIPS), Japan Science and Technology Agency (JST)





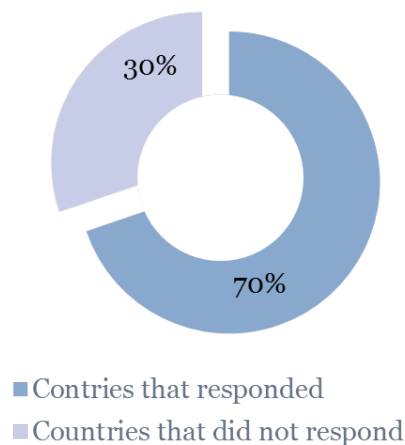
DSIP initiative in New Zealand



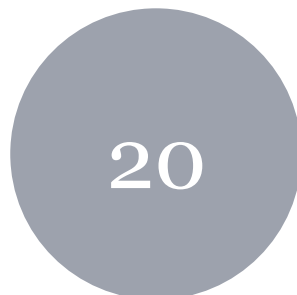
DSIP survey

Autumn 2017- Spring 2018

Questionnaire



Interviews with DSIP administrators



A total number of surveyed DSIP initiatives: **39**

The survey explored issues related to the founding, funding, purpose and scope of DSIP initiatives and the impacts they have.

- *Types of data:* DSIP systems mainly aggregate data on research outputs, funding, research personnel and R&D projects. Several systems have data on research impacts, research equipment and facilities and policy documents.
- More than a half of DSIP systems is used for developing *science and innovation indicators*
- *Users:* Systems are mainly used by government agencies, public funders, HEIs and researchers.
- *Major barriers:* data quality, interoperability of digital systems, and trust in digital technologies



The galaxy of DSIP actors

DSIP initiatives are shaped by interactions of public and private organisations including, but not limiting to ministries, public funders, not-for-profit organisations, national statistical offices, patent agencies, Higher Education Institutions (HEI), Public Research Institutes (PRI), firms, research libraries and not-for-profit organisations





Private sector roles in DSIP initiatives

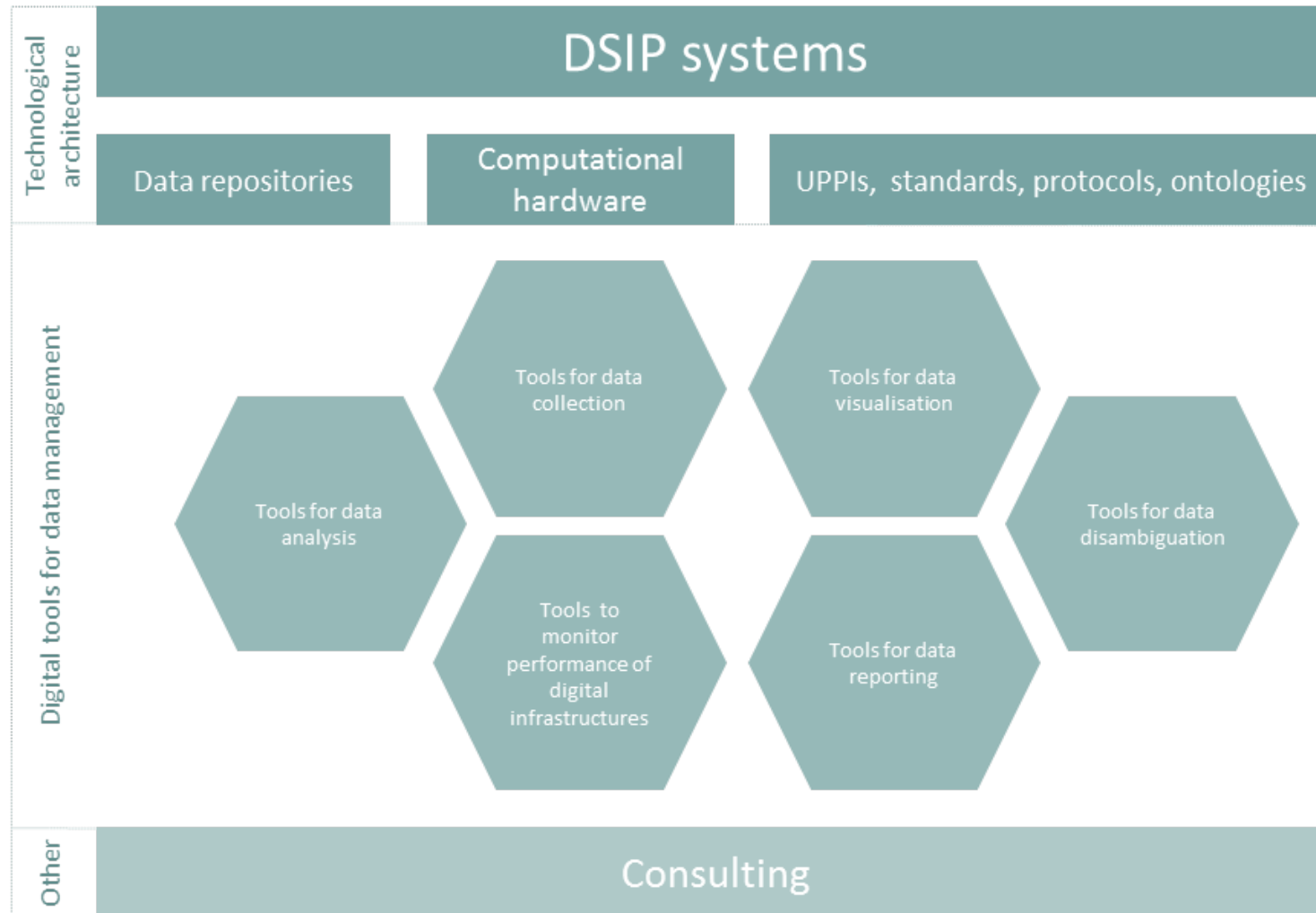


- **Main players:** academic publishers (Holtzbrink Publishing Group), information analytics companies (Elsevier, Clarivate Analytics), and technology companies (Google, Microsoft), social networks for academics (ResearchGate, Academia.edu), charities (Alfred P. Sloan Foundation)
- **Potential pitfalls:** discriminatory access to data, overreliance on proprietary solutions, biases and inaccuracies in data analysis





Contribution of the private sector



Key challenges of DSIP



- A lack of trust in digital technologies and data privacy concerns act as serious barriers for maintenance and development of DSIP systems.
- Further development of DSIP initiatives is burdened by insufficient levels of interoperability of data sources. This challenge involves technical (Application Programming Interfaces (APIs) and unique identifiers), semantic (metadata standards and ontologies) and governance (common policy frameworks incentivising interoperability among digital systems) aspects.



Policy response

- A need for cross-government strategy for management, sharing, dissemination and analysis of data related to research and innovation activities. That involves implementation of existing international standards for data management or development of new ones with a view of international dynamics;
- Introduction of common data formats, unique identifiers, Application Programming Interfaces (APIs) across the whole public sector;
- Changes in IT procurement strategies in order to amplify the benefits and mitigate the risks of the participation of the private sector in DSIP;
- Introduction of data management plans and support of data management culture in government agencies;
- Reconsideration of the system of incentives, changes in organisational cultures in the public sector





The role of the Organisation for Economic Cooperation and Development (OECD)



- Consolidation of DSIP community for mutual learning and collaboration;
- A standard setting organisation:
Guidelines on access to and use of meta-data generated in the course of publicly funded research and innovation activities





THANK YOU FOR YOUR ATTENTION

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