Data Spaces

Introduction to European digital landscape

ISO-TC211 / EC-JRC / EuroGeographics webinar on Data Spaces, 5 June 2025

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A new context is ahead
We should learn how to share data differently!

Image generated through Artificial Intelligence

European Commission

European Commission
Political Priorities 2024-2029

[A new plan for Europe's sustainable prosperity and competitiveness]

[A new era for European defence and security]

[Supporting people, strengthening our societies and our social model]

https://commission.europa.eu/priorities-2024-2029_en

[Sustaining our quality of life: Food security, water and nature]

[Protecting our democracy, upholding our values]

[A global Europe: Leveraging our power and partnerships]

[Delivering together and preparing our Union for the future]

European Commission
Political Priorities 2024-2029

A new plan for Europe's sustainable prosperity and competitiveness

Boost productivity with digital tech diffusion

- Encourage investments in digital infrastructures to improve access to secure, fast and reliable connectivity.
- Continue to step up our enforcement of the EU digital laws.
- Step up investment in high-value technologies (supercomputing, IoT, quantum computing, semiconductors, genomics, space technologies…)
- Ensure access to supercomputing capacity for AI startups and industry via an AI continent action plan.
- Boost new industrial uses of AI and improve public services.
- Ensure seamless and at-scale data sharing with a European Data Union Strategy.

Put research and innovation at the heart of our economy

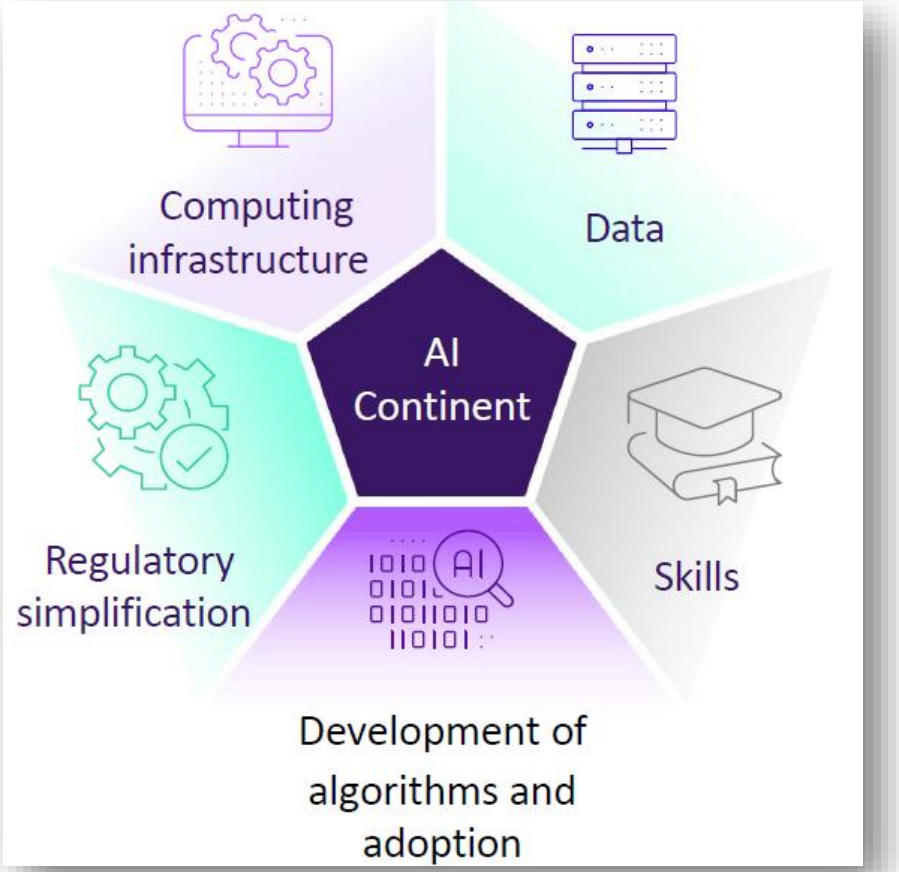
- Increase research spending to focus more on strategic priorities.
- Support green and digital transitions by developing high-value technologies.

European Commission
Political Priorities 2024-2029

AI Continent Action Plan - Making Europe a Global AI Leader

Roadmap to position Europe as a global frontrunner in artificial intelligence.

- Expanding AI infrastructure: creation of "AI Factories" and "AI Gigafactories" equipped with state-of-the-art computing resources.
- Launching the Data Union Strategy to ensure access to high-quality data for AI development.
- Driving AI adoption in both industry and the public sector through the Apply AI Strategy (practical use of AI solutions).
- Strengthening AI skills with new training programmes and the establishment of an AI Skills Academy.
- Simplifying regulations and supporting businesses with tools like the AI Act Service Desk.



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European Data Union Strategy - Unlocking the Power of Data

Ensuring access to high-quality data.

Goals

- Break down barriers to cross-border data use.
- Streamline data rules, and create a coherent legal and technical framework that enables innovation.
- Ensuring data sovereignty and protection for individuals and businesses.
- Reduce bureaucracy which is unnecessary.
- Build on the earlier European Data Strategy (2020): https://europa.eu/!4HfX6Q

Actions

- Data Labs within the AI Factories:
  - Integrate & organise data from different sources for AI developers.
  - Link to Common European Data Spaces.
  - Provide data-related services (e.g., cleaning and enriching datasets)
- Development of a shared cloud software.
- Repository of high-quality language resources: Alliance for Language Technologies (ALT-EDIC).

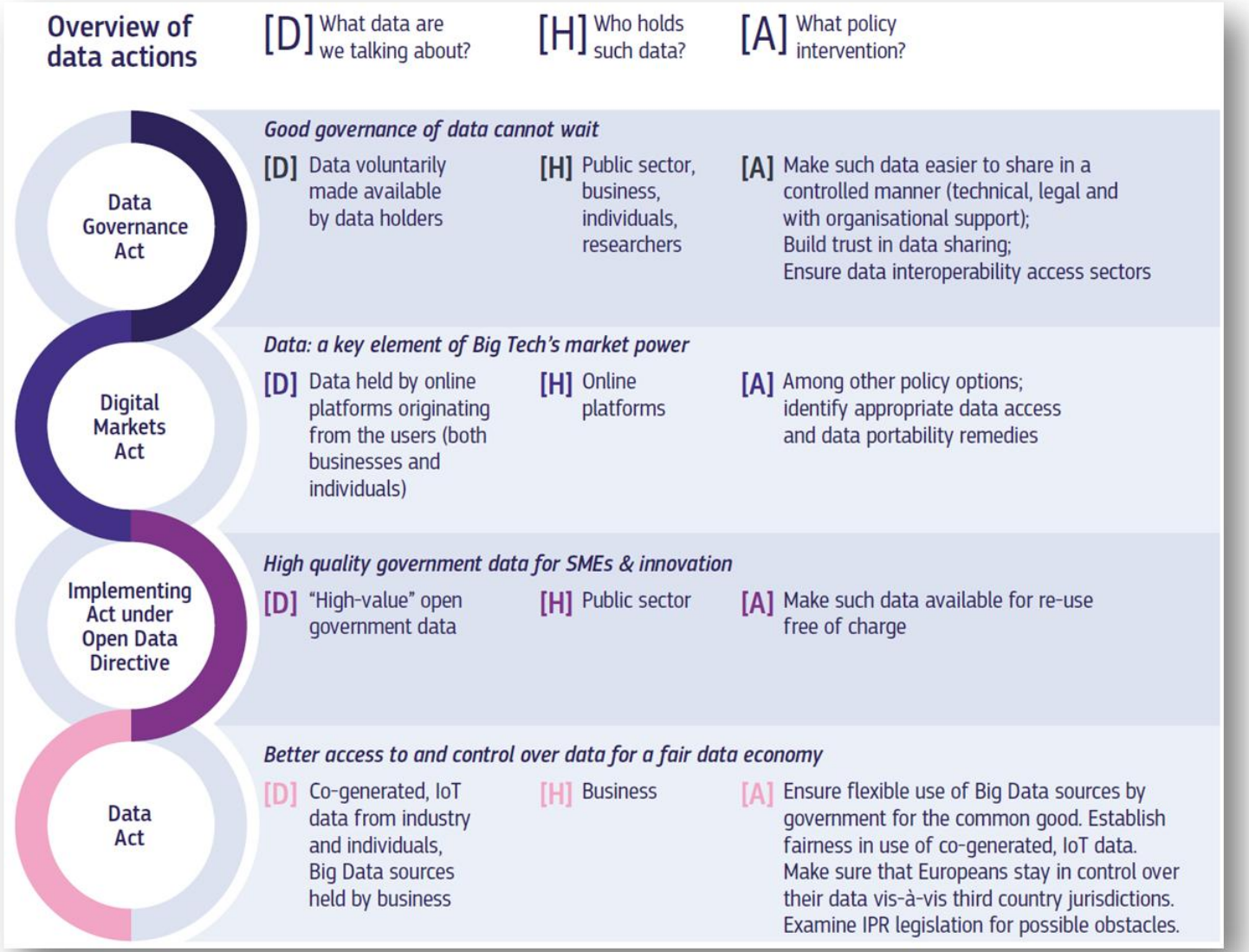
EU Data Strategies & Digital framework
The backbone for digital innovation

1. Data Governance Act
- Build trust in data sharing.
- Data interoperability.

2. Digital Markets Act
- Data portability.
- Assure fair practices by ‘gatekeepers’.

3. Implementing Act - Open Data Directive
- Increase data availability and access.
- Reduce heterogeneity in licensing.

4. Data Act
- Increase data availability to foster innovation / Incentivize data generation.
- Fair access to and use of data.
- Data sovereignty.



Source: adapted from European Commission

At the heart of the digital agenda
Data spaces

Data production, processing & sharing

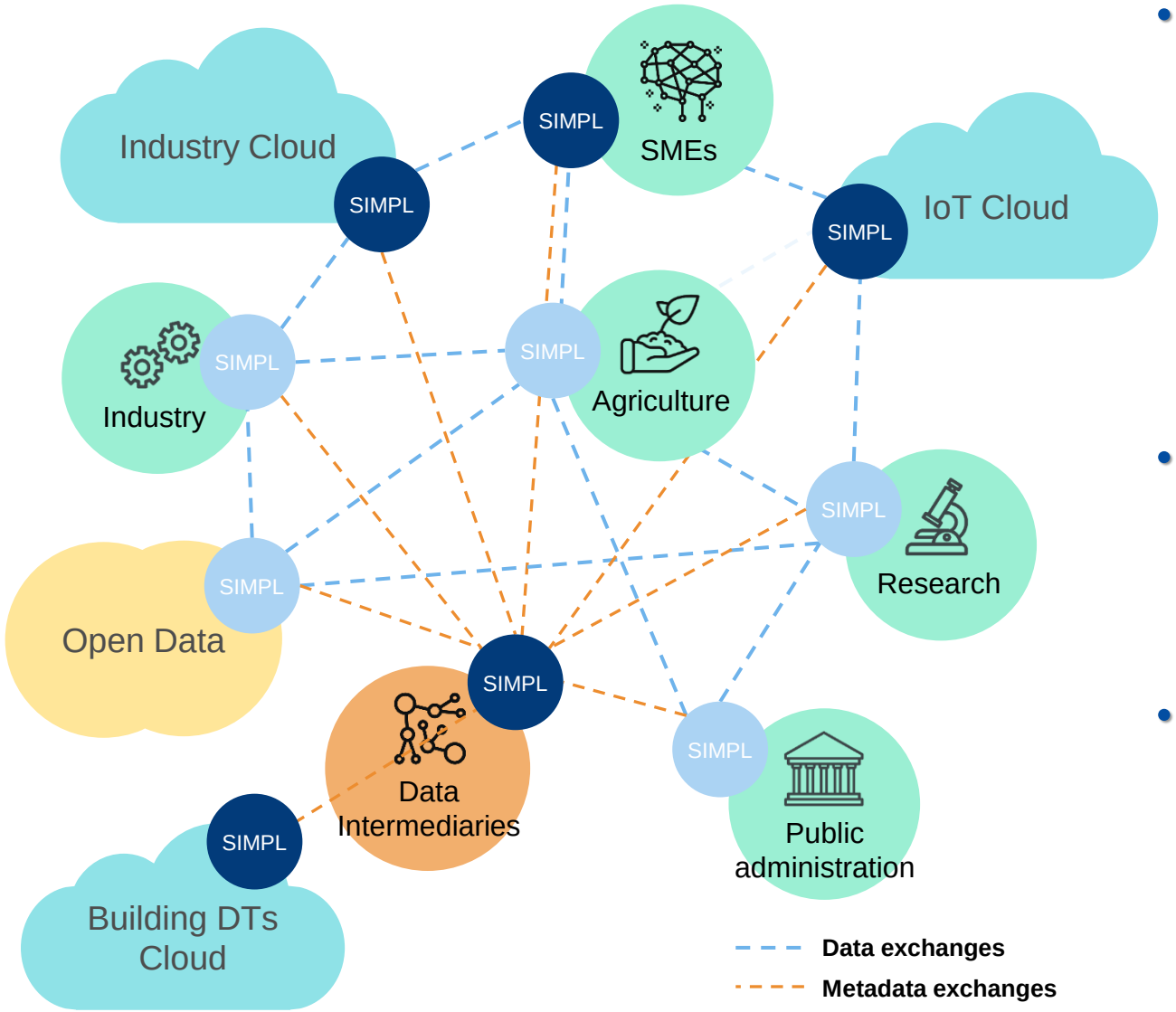
- Decentralized, federated data infrastructure enabling secure and standardized data sharing across organizations.
- Reducing silos, enhancing decision-making.
- Ensuring data sovereignty and security.

https://europa.eu/!jBGmyK

https://europa.eu/!76tmpy

https://europa.eu/!6nGTHg

At the heart of the digital agenda
Data spaces



- **Governance vision**
  - Federated data ecosystem (shared policies and standards).
  - Participants may access data in a secure, transparent, reliable, easy and unified way.
  - Data owners stay in control of their data (access, reuse purposes, conditions).
- **Technical vision**
  - Not physical data integration - Data sharing based on distributed data warehouses created for specific needs.
- **SIMPL** (Cloud-to-edge federations)

https://digital-strategy.ec.europa.eu/en/policies/simpl#tab_3

JRC is performing experimental work with SIMPL, alternative and privacy preservation technologies.

Graphic prepared by @EC-DG CNECT

At the heart of the digital agenda
Data spaces

Technology Safeguards for the Re-Use of Confidential Data

Application of Federated Learning for National Forest Inventories

- Strategies to unlock the (re-)use of confidential data.
- To allow its (re-)use, safeguards are needed to protect data and to establish trust.
  - Technological safeguards
  - Federated settings.
- Data Visiting. Advantages and disadvantages.

https://europa.eu/!pwQqGX

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SCIENCE FOR POLICY BRIEF

JRC Data Insights

Technology Safeguards for the Re-Use of Confidential Data

Application of Federated Learning for National Forest Inventories

HIGHLIGHTS

To fully exploit the economical and societal value of confidential data and avoid incurring opportunity costs, strategies to unlock their re-use are increasingly needed.

Re-using confidential data requires safeguards to protect the data and establish trust. In this document, the focus is on technological safeguards that can be deployed in federated settings. Such safeguards are illustrated for the case of National Forest Inventories and can be generalised to other cases and data sets.

Data Visiting is a technological paradigm in which holders can retain full control of their confidential data. Algorithms are shared with data holders to be run on data, and only results (not data) are shared.

Advantages and disadvantages of Data Visiting are discussed, as well as potential risks and available countermeasures. Additional safeguards can be used jointly with Data Visiting strategies to further protect data and data holders, thus reducing inherent risks.

RE-USE OF CONFIDENTIAL DATA: WHY IT MATTERS

In today's digital age, vast amounts of data are constantly created and collected. Some data are openly shared and carry no restrictions on their use or processing, while others are protected and subject to restrictions or inaccessible for re-use by third parties. This incurs *opportunity costs*, i.e., losses from not tapping on the potential value of data in known applications. Data to be protected can be personal or non-personal. Sensitive personal data are protected by the EU GDPR (2016/679). Sensitive non-personal data are referred to as *confidential* in this document. They are often deemed so due to commercial or intellectual property constraints, in addition to operational reasons.

Take the case of **National Forest Inventories** (NFIs). NFIs collect and store data coming from the long-term monitoring of forests. NFI authorities use both temporary field plots (measured only once) and permanent plots (fixed locations) to monitor the health of a forest.

Figure 1 - measurements carried out in forests.

source: curated by Valerief on Unsplash

Institutions in charge of NFIs consider that the location of permanent plots should not be shared to avoid changes in the forest management, which could bias or otherwise compromise the statistics derived from the data. Hence, the locations of the permanent plots are considered *confidential statistical units* and access by third parties is limited or

Joint Research Centre

AI and Data spaces
Building capacity and competence

BODY	EDIH (EUROPEAN DIGITAL INNOVATION HUB)	EDIC (EUROPEAN DIGITAL INFRASTRUCTURE CONSORTIUM)
Purpose	Supports digital transformation of companies and public sector at regional level	Implements large-scale, multi-country digital infrastructure projects
Legal Status	Independent entity or consortium, often non-profit	Legal entity established by European Commission decision; governed by statutes of members
Main Activities	Provides digital expertise, "test before invest," training, innovation services, and networking	Deploys and operates joint digital infrastructure, delivers services at European scale
Funding	50% EU (Digital Europe Programme), 50% national/regional/private sources	Member States' contributions, possibly complemented by EU/national grants and other sources
Governance	Local/regional, often with strong involvement of local authorities and stakeholders	Member States hold majority of votes and control governance; statutes define internal rules
Target Users	SMEs, mid-caps, startups, public sector organizations, especially at local/regional level	Member States, public/private entities, end users, industry (as defined by founding members)
Scale	Regional with pan-European network for knowledge exchange	Pan-European, focused on cross-border infrastructure and services

Digital Europe Programme
New Work Programme 2025-2027

EU Digital & Tech
54.601 seguidores
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The future of key technologies in Europe is now.

The new work programme for 2025-2027 of the Digital Europe Programme was just adopted and it is set to fund critical digital technologies, key in boosting AI innovation in Europe and contributing to EU tech sovereignty and competitiveness.

With €1.3 billion, the programme will focus on:

☑ Making Europe an AI continent, thriving on the development, integration and adoption of AI.
☑ Supporting the European Digital Innovation Hubs (EDIHs) as a means for the large-scale deployment of AI via the support of private and public organisations across Europe.
☑ The development of the Destination Earth initiative that will build a digital twin of Earth to support climate adaptation and disaster risk management.
☑ Facilitating the new EU Digital Identity Wallet architecture and its European Trust Infrastructure
☑ Boosting cyber resilience, developing EU education and training institutions capacity in digital & much more!

Check out the press release to find out more: https://europa.eu/!cGh9kv
#DigitalEUProgramme #AIinEurope #DigitalEU

Key takeaways
Sneak peek for discussion

Find new (and better) ways of sharing EU data from different sources.

- Data Spaces
  - Require an open and flexible governance.
  - Wider ecosystem, source and actor types.
  - Embrace digitalization & new technologies.
  - Ensuring data interoperability (right-level), sovereignty and security.
  - Need for a common, consistent approach for location data.
  - Understanding and applying these technologies demand capacity building (EDIHs / EDICs).
  - Public-private-academia partnerships may bring substantial gains.
  - First experimental results are starting to flourish.
  - High-quality data needed to fuel AI.
- FAIR, TRUST & High-quality data
  - Provide FAIR access to data.
  - Ensuring data quality in data spaces is essential.
  - Need for clever catalogues. Crucial role of metadata and provenance information.
  - Liability. Public trust and confidence.
  - Keep compliance with existing regulations and standards.
- Investments
  - Innovation is required more than ever.
  - Application for EU funding available.
  - Resistance to adapt may lead to obsolescence and decreased competitiveness.

Thank you

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