Vision of the development of national Spatial Data Infrastructures

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PRVA KONFERENCA GEO SLOVENIJA

Sotočje prostorskih strokovnjakov























Objective

Present some visionary thought about (national) spatial data infrastructures

Outline INSPIRE

Policy context

Technology trends

Conclusion







INSPIRE

Directive entered into force in 2007

- Technical and governance framework
- Data: 90000+ datasets documented through metadata
- Exposed through services, some are harmonised

Community

- 7000+ data providers
- Close collaboration with open source communities, spatial data organisations and academia









INSPIRE – the benefits

INSPIRE: Intrastructure 15 in 19 in

Change of mind set towards open data and data sharing Improved efficiencies on the national level

Enabler of open-source technology

Impact on standardisation

A strong community







INSPIRE

INSPIRE – the limitations

Provider/public sector centrism

Hardcoding of technical aspects in legislation

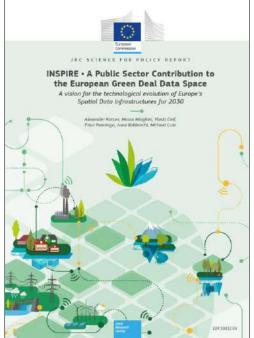
Overly complex specifications

Strong influence of specific standards

Parallel implementations

No evidence of who is using what and why











INSPIRE – Vision

Data sharing is not a goal in itself. To remain fit for purpose, INSPIRE should support data-driven decision-making and innovation

To be sustainable, INSPIRE should 'blend in' with the broader ecosystem of spatial and non-spatial data, infrastructures, technologies and policies

Opening up to a broader community of implementers and users and to a wider range of applications and use cases

Making the INSPIRE framework more flexible and agile will significantly lower the entry level to the sharing and use of data

Technical approaches need to be simplified by reusing well-adopted standards and technologies







INSPIRE – Suggested actions

Legal

Avoid overspecification in legislation

Use a simple licensing framework

Organisational

Embrace co-design by default Rethink the existing governance structures

Adopt an ecosystem approach

Technological

Continue to improve the discoverability/accessibility of data Ensure neutrality and embrace welladopted standards and technologies Embrace well-documented, standard-based APIs Optimise data for search engines Leverage on the developments of federated European cloud infrastructure

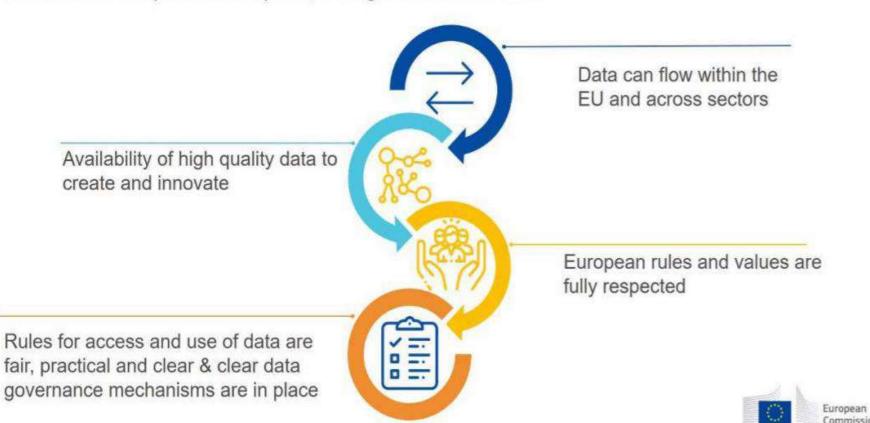






Policy context – European strategy for data (2020)

A common European data space, a single market for data









Policy context – Legal framework

Data Governance Act – data spaces

- Build trust in data sharing.
- Data altruism, data intermediation.
- Data interoperability.

Digital Markets Act

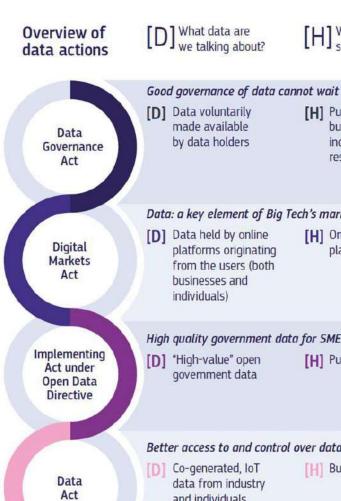
- Data portability.
- Regulate practices of 'gatekeepers'.

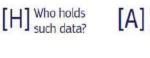
Open Data Directive

- Increase data availability and access.
- Reduce heterogeneity in licensing.

Data Act

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





[A] What policy intervention?

[H] Public sector,

business, individuals. researchers [A] Make such data easier to share in a controlled manner (technical, legal and with organisational support); Build trust in data sharing; Ensure data interoperability access sectors

Data: a key element of Big Tech's market power

[H] Online platforms

[A] Among other policy options; identify appropriate data access and data portability remedies

High quality government data for SMEs & innovation

[H] Public sector

[A] Make such data available for re-use free of charge

Better access to and control over data for a fair data economy

and individuals. Big Data sources held by business

[H] Business

Ensure flexible use of Big Data sources by government for the common good. Establish fairness in use of co-generated, IoT data. Make sure that Europeans stay in control over their data vis-à-vis third country jurisdictions. Examine IPR legislation for possible obstacles.

Policy context - Data space

A distributed system defined by a governance framework that enables secure and trustworthy data transactions between participants while supporting trust and data sovereignty. A data space is implemented by one or more infrastructures and enables one or more use cases.









Policy context - Data space

Agenda setting

POLICY STAGES

Policy design

Implementation

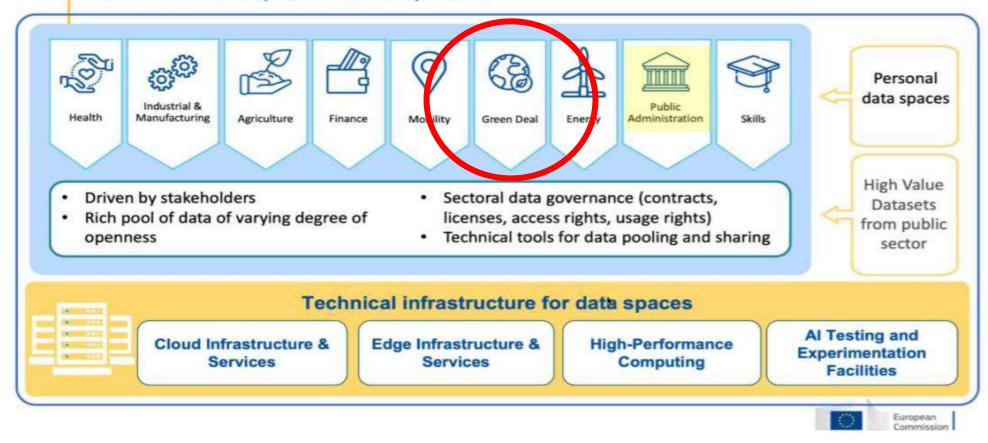


European Data Spaces - Scientific Insights into Data Sharing and Utilisation at Scale, JRC Publication 2023

Vision High-level concept EU single for data sharing market in Europe for data data sovereignty, **Principles** transparency, security, Mind set for sharing fairness, consumer protection, data based on fundamental rights, citizen centricity, social values data altruism, inclusion, sustainability, openness, self-determination, trust, fair competition, innovation Requirements Verifiable functional and interoperability, findability, security, privacy, preservation, access control, reusability, non-functional requirements data governance, portability, data sovereignty, scalability, auditability, trustworthiness **Features** Federated Agreed licensing Common vocabularies Specific properties infrastructures frameworks of data space instances, aligned with the principles Privacy preserving environments Validation services Semantic assets and implementing some or all of the requirements **Electronic Identification** Adoption of open source software

Policy context – Common data spaces

Common European data spaces









Policy context – EU initiatives on data spaces

Legislations:







Funding:





Consolidation and development:







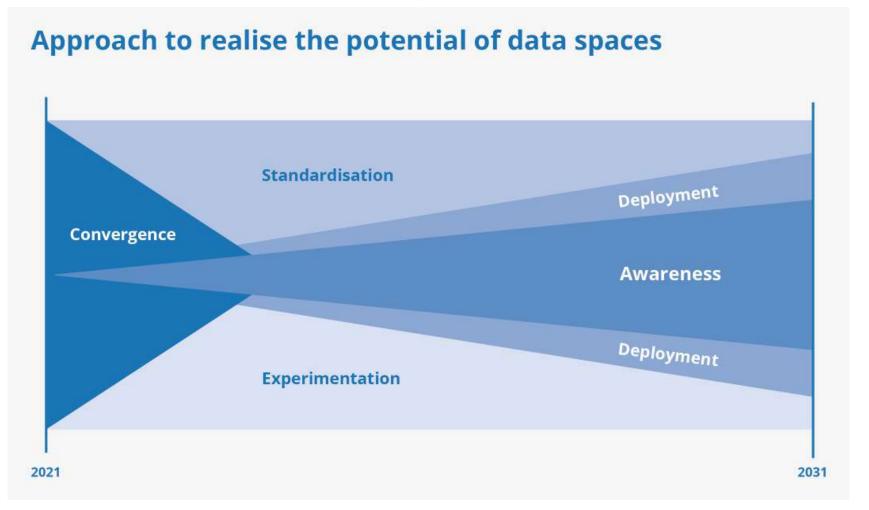








Policy context – Timing of data spaces



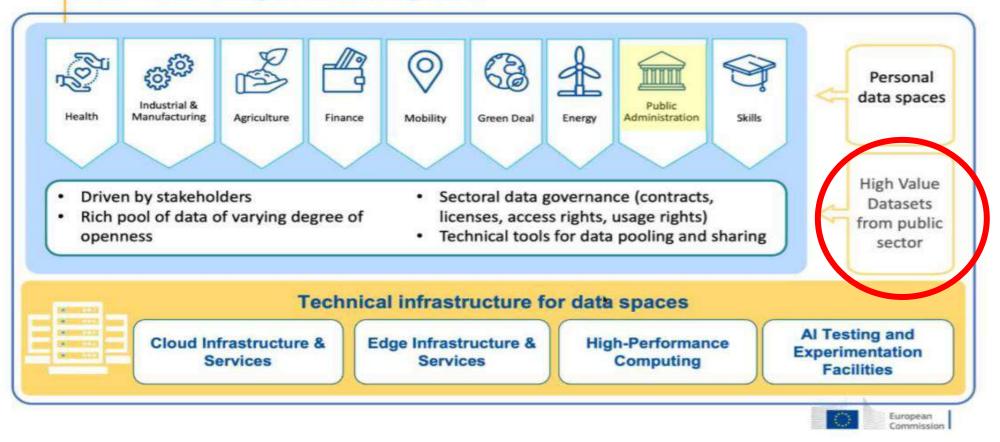






Policy context – Common data spaces

Common European data spaces









Policy context - Open data directive / High Value Datasets

Implementing Rule HVD – In force 9 June 2024

- Availability for re-use under the conditions of CC0 or, CC BY 4.0 licence, or any equivalent or less restrictive open licence
- Availability via API and where indicated also as a bulk download
- Datasets in scope and arrangements for the publication and re-use for the following 6 categories:
- 1.Geospatial
- 2. Earth observation and environment
- 3.Meteorological
- 4. Statistics
- 5. Companies and company ownership
- 6.Mobility







Policy context – Digital Compass for Europe's Digital Decade

Skills

ICT Specialists: 20 million + Gender convergence Basic Digital Skills: min 80% of population



Government

Key Public Services: 100% online e-Health: 100% availability medical records Digital Identity: 80% citizens using digital ID



Infrastructures

Connectivity: Gigabit for everyone, 5G in all populated areas

Cutting edge Semiconductors: double EU

share in global production

Data - Edge & Cloud: 10,000 climate

neutral highly secure edge nodes

computing: first computer with quantum acceleration

Business

Tech up-take: 75% of EU companies using Cloud/AI/Big Data Innovators: grow scale ups & finance to double EU Unicoms Late adopters: more than 90% of European SMEs reach at least a basic level of digital intensity











Technology trends

Top Strategic Technology Trends 2024

- Al Trust, Risk and Security Management
- 2 Continuous Threat Exposure Management
- 3 Sustainable Technology

- 4 Platform Engineering
- 5 Al-Augmented Development
- 6 Industry Cloud Platforms

- 7 Intelligent Applications
- 8 Democratized Generative Al
- 9 Augmented Connected Workforce

10 Machine Customers

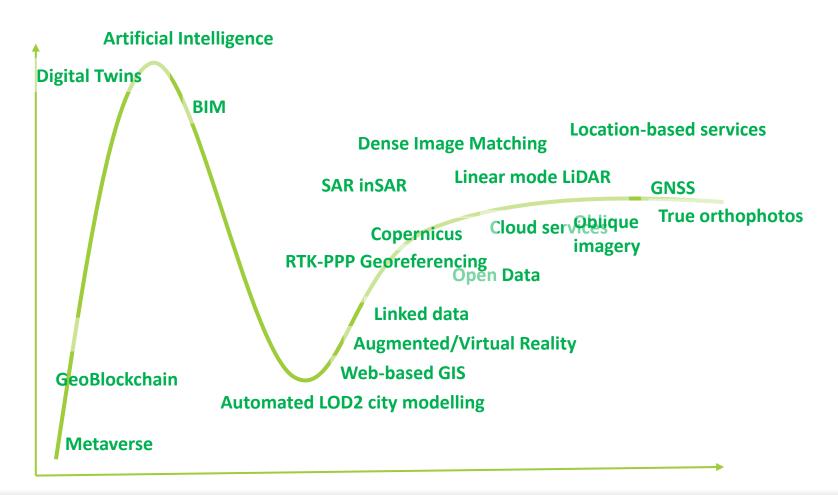








Technology trends – Geospatial hype cycle 2024









Technology trends

Technology trends – Digital Twins

A digital replica or representation of a system, process or place which mimics its real-world behaviour



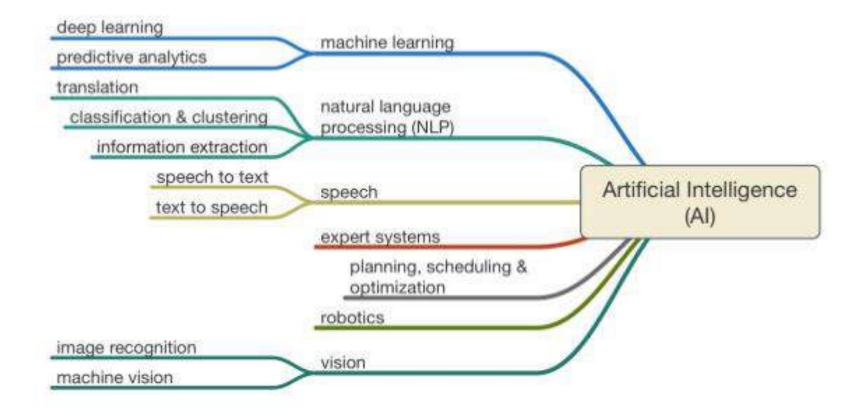








Technology trends – AI -> GeoAI











Vision

Geospatial data will become mainstream -> so not so special

Spatial data infrastructure will blend in broader data ecosystems

Future spatial data infrastructures demand legal, organizational and technological focus

Future spatial data infrastructures will be the foundation for numerous data spaces – in particular the Green Deal data space

Spatial data infrastructure will be the foundation for 'exploiting' emerging technologies such as Digital Twins and AI







Thanks for your attention

KU Leuven & Ljubljana University

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