Portable principles, local conditions: translating data space governance outside the EU

Viivi Lähteenoja[1], Amber Daniels[2], Chris Gentle[2], Marko Turpeinen[3]

[1] 1001 Lakes Oy, University of Helsinki
[2] The Western Australian Biodiversity Science Institute (WABSI)
[3] 1001 Lakes Oy, Aalto University

Keywords: Data space, governance, use case, Australia, environmental data, data analytics, data sharing

Abstract (Submission #214)

What does it take to implement data space governance principles in a jurisdiction where the surrounding business and legal conditions differ from the European context, and what can this tell us about the portability of data space frameworks more broadly?

Building trusted multi-sector data-sharing infrastructure is an active challenge worldwide (see Choi et al. 2022 for South Korea; Dale and Aizawa 2024 for Japan; Ethier et al. 2022 for Canada and Australia; Filgueiras et al. 2025 for Brazil; Mishra and Agarwal 2026, for India; Otto 2022a for the EU). Data space governance frameworks and technical standards have matured (Bacco et al. 2024; Otto 2022b), but implementation still depends on institutional conditions that vary considerably. Where only partially present, building a functioning data space demands design work foreign to frameworks from more favourable contexts.

Contrasting the EU and Australia illustrates this. Like the EU, Australian policy requires trustworthy data sharing across regulators, businesses, and researchers in a federated jurisdiction with marked regional variation. Unlike the EU, key enabling conditions are largely absent: mandatory data-sharing provisions (Data Act), a harmonised privacy baseline (GDPR), and data intermediary models (Data Governance Act). Indigenous Data Governance, or CARE, principles (Carroll et al. 2020) add a local adaptation requirement EU frameworks do not address (chapter 7 in Thabit Gonzalez, Sara and Maccani, Giovanni 2024 being the notable exception).

An infrastructure modelled on the data spaces approach was recently piloted in Western Australia for environmental data sharing. The not-for-profit Shared Environmental Analytics Facility (SEAF) provides a trusted data and information supply chain for evidence-based environmental assessment and decision-making. This paper summarises designing its governance architecture and what data space governance depends on beyond technical specification, outside the EU context.

SEAF applies a hub-and-spoke governance architecture for sovereign environmental data collaboration across government, industry, and research. Its framework combines contractual instruments (a Rulebook, Spoke Agreements, Zone Agreements, and Data Sharing and Access Agreements) with zone-based infrastructure built on the Five Safes framework (Green and Ritchie 2023). Optional, data space-enabled zones align with International Data Spaces Association (IDSA) frameworks. Following the Data Spaces Support Centre (DSSC) blueprint (https://blueprint.dssc.eu/, accessed 18 May 2026), governance authority and operator functions are conceptually separated, enabling an operator-agnostic architecture for participants with different cultures and risk tolerances. Contributors retain control over the data they make available.

Four design choices and tensions emerge in SEAF's ecosystem governance: enabling multi-sector contribution, localisation of EU-native frameworks, a stepwise approach, and service provider design.

Enabling multi-sector contribution to shared analytics. SEAF generates environmental assessment products from data across these sectors, governing ingress, analysis, and outputs in one framework. Conditions differ materially: government and industry require confidentiality and controlled access, research openness and attribution, and outputs may carry conditions by sensitivity. The framework must therefore impose uniform governance across all stages while configuring conditions per sector. This profile-sensitive approach sits in tension with the IDSA Manifesto (International Data Spaces Association 2025), which stresses data space neutrality and participant equality; for SEAF, accommodating sectoral needs secured buy-in while preserving each participant's right to set rules for its own data.

Localisation of international frameworks. International frameworks, including IDSA's, provide useful technical and trust patterns for sovereign exchange but do not remove the need for local design. In the SEAF context, legal authority, participant obligations, data custodianship, analytical product release, Indigenous Data Governance, and cross-sector accountability must be resolved through Australian instruments. SEAF therefore treats international standards as an interoperability and trust layer, not a model adopted wholesale, keeping a profile suited to Australian environmental data, regulatory use, commercial sensitivity, and cultural obligations.

A stepwise approach to building a federated ecosystem. SEAF deploys not a single data space but an ecosystem of Spokes, each scoped to its participants' trust and risk profile yet governed through a unitary Hub (SEAF) as Governance Authority. Cross-Spoke interoperation is possible but deliberately not assumed, since contributing to shared analytics is itself novel for many and trust must be built simultaneously across sectors with no history of sharing, organisations with differing risk tolerances, and frameworks at different scales. Premature integration could undermine this, so the architecture builds trust at the Spoke level first and leaves federation as a maturity step, not a foundation, with implications for sequencing and network effects without compromising sovereignty.

One operator over multiple intermediaries. Beyond acting as Governance Authority and Hub, SEAF also serves as data space operator: the infrastructure for data processing environments (zones) and their interconnections within a Spoke (connectors) is run by a single provider. The design allows another actor to operate Spokes, or provision distributed across multiple intermediaries; for now, for operational simplicity and stepwise trust-building, the ecosystem has a single operator.

The SEAF experience points to several observations with broader relevance.
First, data space governance is not primarily a technical problem but a contractual and institutional one, most shaped by the regulatory environment: the enabling technical components are secondary to the governance instruments that define who can do what with whose data and under what conditions.

Second, building such an ecosystem without the EU's harmonised governance policy, regulatory settings, and recognised intermediary models requires participation and trust to be reconstructed through governance design. This is achievable but resource-intensive. Relying on voluntary participation, not grants, as the primary lever for network effects has structural implications: participation hinges on perceived benefit alone, network effects are slower and more fragile early on, and governance instruments must work harder to sustain trust without a regulatory floor.

Third, multi-sector collaboration amplifies these challenges, surfacing a complexity homogeneous contexts do not. Negotiating shared norms across sectors with different data cultures requires deliberate design work standard frameworks omit; the tension between confidentiality and openness as competing defaults is resolved not by technical architecture but by governance instruments capable of holding multiple defaults simultaneously. SEAF shows core data space principles are portable to a jurisdiction lacking these enabling conditions, but the supporting conditions must be rebuilt through contractual and institutional means — more demanding, and yielding a different architecture. For similarly constrained jurisdictions, governance instrument design is the hard work: the technical layer follows, with long-term consequences for participation, enforceability, and network growth.

References

Bacco, Manlio, Alexander Kocian, Stefano Chessa, Antonino Crivello, and Paolo Barsocchi. 2024. 'What Are Data Spaces? Systematic Survey and Future Outlook'. Data in Brief 57 (December): 110969. https://doi.org/10.1016/j.dib.2024.110969.

Carroll, Stephanie Russo, Ibrahim Garba, Oscar L. Figueroa-Rodríguez, et al. 2020. 'The CARE Principles for Indigenous Data Governance'. Data Science Journal 19 (1): 1. https://doi.org/10.5334/dsj-2020-043.

Choi, Wona, Se-Hyun Chang, Yoon-Sik Yang, et al. 2022. 'Study of the Factors Influencing the Use of MyData Platform Based on Personal Health Record Data Sharing System'. BMC Medical Informatics and Decision Making 22 (1): 182. https://doi.org/10.1186/s12911-022-01929-z.

Dale, John G., and Nobuhiro Aizawa. 2024. '"Data Free Flow with Trust": Japan's Struggle to Integrate Democracy and Human Rights into Digital Trade Policy'. Frontiers in Sociology 9 (September). https://doi.org/10.3389/fsoc.2024.1397528.

Ethier, Marie-Chantal, Juliana Wu, Carina Marshall, and Felicity Flack. 2022. 'Cross-Jurisdictional Data Access Processes and Coordination in Two Countries: Key Learnings and Innovative Approaches.' International Journal of Population Data Science 7 (3). https://doi.org/10.23889/ijpds.v7i3.2033.

Filgueiras, Fernando, Lizandro Lui, Thayná Gomes Rosa, and Gabriela Candido Ferreira. 2025. 'The Institutional Design of Data Governance in Brazil: Entropy, Restrictiveness and Institutional Grammar'. Policy Design and Practice 8 (1): 64–88. https://doi.org/10.1080/25741292.2025.2460838.

Green, Elizabeth, and Felix Ritchie. 2023. 'The Present and Future of the Five Safes Framework'. Journal of Privacy and Confidentiality 13 (2). https://doi.org/10.29012/jpc.831.

International Data Spaces Association. 2025. 'The Data Space Manifesto'. International Data Spaces Association, April 29. https://internationaldataspaces.org/the-data-space-manifesto-why-now-why-it-matters/.

Mishra, Neha, and Binit Agarwal. 2026. 'The Emerging Framework for Non-Personal Data Protection in India: Perils, Promises, and Lessons for the Developing World'. International Journal of Law and Information Technology 34 (January): eaaf025. https://doi.org/10.1093/ijlit/eaaf025.

Otto, Boris. 2022a. 'A Federated Infrastructure for European Data Spaces'. Communications of the ACM 65 (4): 44–45. https://doi.org/10.1145/3512341.

Otto, Boris. 2022b. 'The Evolution of Data Spaces'. In Designing Data Spaces : The Ecosystem Approach to Competitive Advantage, edited by Boris Otto, Michael ten Hompel, and Stefan Wrobel. Springer International Publishing. https://doi.org/10.1007/978-3-030-93975-5_1.

Thabit Gonzalez, Sara and Maccani, Giovanni. 2024. Unlocking Green Deal Data: Innovative Approaches for Data Governance and Sharing in Europe. Publications Office of the European Union. https://data.europa.eu/doi/10.2760/0517622