March 2026

Report on World Forum Data Spaces & AI

Introduction / Summary

The World Forum on Data Spaces & AI was held on 5 March 2026 at the European Convention Center Luxembourg (ECCL). It was co-organized by International Open Forum on Data Society (IOFDS), Luxembourg National Data Service (LNDS), DataSpace4Luxembourg, the University of Luxembourg, and Data Spaces Hub Luxembourg, bringing together more than 150 participants from industry, academia, and government.

The forum consisted of four welcome messages, five panel sessions, and sixteen keynote presentations, covering key domains such as standardization, manufacturing, healthcare, finance, space, and smart cities.

Across the sessions, the forum highlighted the rapid evolution of data spaces from conceptual frameworks to practical infrastructure for trusted data sharing and AI-driven innovation.

The discussions converged on several key priorities:

First, the strongest message was the need for global alignment and interoperability of data spaces. With multiple initiatives emerging across regions, participants emphasized coordination among international standardization bodies and ecosystems to avoid fragmentation and enable scalable cross-border data exchange.

Second, there was a clear recognition that data spaces and AI are becoming inseparable. High-quality, well-governed data was identified as the foundation for trustworthy AI, while AI technologies are increasingly required to unlock value from complex and distributed data environments.

Third, the forum highlighted that adoption and economic value are now the critical challenges. While technical foundations are advancing, scaling data spaces requires clear business models, reduced implementation costs, and accessible solutions—especially for SMEs—supported by concrete use cases.

Fourth, discussions pointed to the need for practical governance approaches that balance openness and control, addressing regulatory complexity and cross-border differences while enabling trusted and efficient data sharing.

Overall, the forum underscored that the next phase of data spaces will be defined not only by technology, but by global coordination, real-world deployment, and integration with AI ecosystems.

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1 Date & Facility

5 March 2026, at the ECCL - European Convention Center Luxembourg

2 Organizers

Co-organized by International Open Forum on Data Society (IOFDS), Luxembourg National Data Service (LNDS), DataSpace4Luxembourg, the University of Luxembourg, and Data Spaces Hub Luxembourg, as shown in the logos.

LinkedIn: (27) World Forum on Data Spaces & AI 2026: Posts | LinkedIn

3 Sponsors

The event was supported by NTT DATA, Dell, Luxembourg AI Factory, and The Dots.

4 Attendees

More than 150 participants (total: 159)

5 Opening Addresses

5.1 Ministerial address: Stéphanie Obertin (Minister for Digitalisation, Luxembourg)

Minister Obertin emphasized that data has become a central strategic asset in the 21st century, underpinning digital sovereignty, scientific progress, and economic development. Given that data is generated continuously in everyday life, she stressed the need for responsible and transparent data governance.

She introduced the Luxembourg Data Factory as the core of the country's data governance strategy, serving as the central hub for coordinating the national and international data ecosystem, including European data spaces. The government has adopted a centralized governance model to avoid fragmentation and inefficiencies, ensuring clarity, trust, and effective implementation.

The Minister highlighted the establishment of the Luxembourg Data Authority (operational since December 2025), which provides a "one-stop shop" for access to public sector data. Through a single request process via the national data portal, users can access aggregated data within a secure environment managed by the government, reducing administrative burden and ensuring data sovereignty.

She also noted that this governance model is being applied to European data spaces, including the designation of the Luxembourg Data Authority as the Health Data Access Body under the European Health Data Space Regulation.

Finally, she positioned Luxembourg as a leading hub for trusted and efficient data reuse, emphasizing that innovation must be supported by simplicity, transparency, and trust, and invited stakeholders to engage via the Luxembourg Data Portal.

5.2 Ministerial address: Marco Schuldt (Government Director, BMWK)

Marco Schuldt (BMWK, Germany) highlighted that data has become a critical asset and that value creation is increasingly driven by AI, particularly in the context of Industry 4.0. He noted Germany's long-standing efforts in developing industrial data frameworks, including reference architectures, trust technologies (e.g., Asset Administration Shell), and ecosystem initiatives such as Catena-X, Manufacturing-X, and GAIA-X.

He emphasized the urgent need for Germany and Europe to accelerate digital and AI adoption to enhance competitiveness and resilience, particularly in industrial (B2B) contexts. While AI discussions often focus on consumer applications, industrial AI is essential but faces challenges such as fragmented initiatives and the need for a more integrated European digital market.

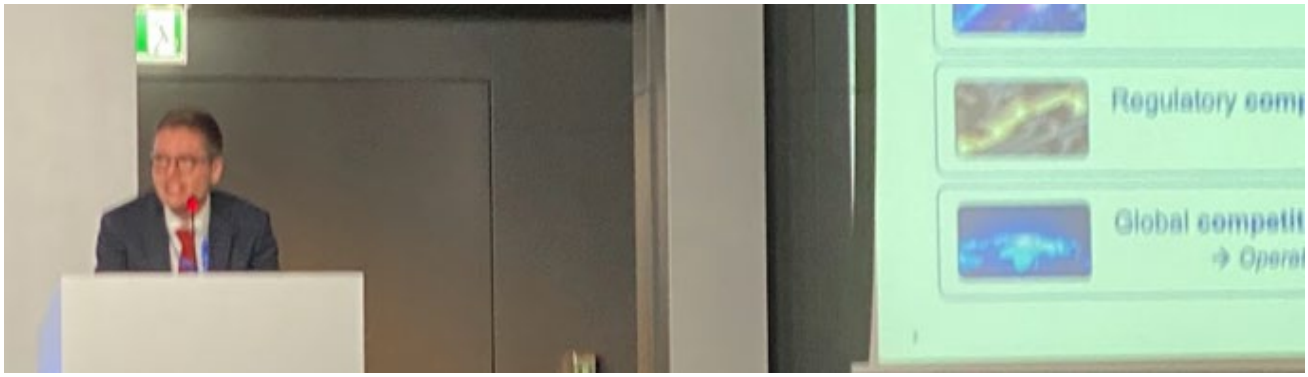
Schuldt stressed that industrial AI has distinct requirements, including high reliability, security, and low latency, and must address domain-specific use cases where incorrect outputs are unacceptable. He also noted

that industrial data is often sensitive and siloed, making data spaces a key enabler for secure data sharing while preserving sovereignty. This also presents an opportunity for Europe to develop sovereign industrial AI capabilities based on trusted data ecosystems.

He outlined ongoing European efforts, including GAIA-X, Manufacturing-X, and open-source initiatives such as Eclipse Tractus-X, as well as emerging work on sector-specific AI models. He emphasized the need for coordinated European action to develop AI foundation models, ensure access to high-quality industrial data, and support fine-tuning for specific industries, combining pre-competitive collaboration with market competition.

Finally, he introduced a new European initiative involving multiple member states (coordinated by Germany, with participation from Japan), currently in the expression-of-interest phase, with further collaboration to be advanced through an upcoming matchmaking event in Berlin.

5.3 European Address: David Schoenwerth (DG CNECT, European Commission)



David Schoenwerth provided an update on the European data strategy, noting its foundation in the 2024 Draghi Report and the subsequent development of the Data Union Strategy, which aims to enhance data utilization for AI, innovation, and broader economic and societal purposes.

He identified three key challenges: limited availability of high-quality data for AI, increasing regulatory complexity due to multiple digital laws, and the growing geopolitical importance of data requiring a balance between openness and protection.

To address these challenges, the strategy is structured around three pillars. First, improving access to high-quality data through initiatives such as Data Labs, which aim to bridge data spaces and AI development while supporting data pooling, anonymization, and compliance. This pillar also includes strengthening cloud and edge infrastructure and continuing support for European data spaces and high-value datasets.

Second, simplifying the regulatory framework through consolidation of legal provisions, ongoing digital simplification efforts, and targeted updates to GDPR to improve clarity while maintaining strong data protection. A broader “fitness check” is also underway to assess overlaps and inefficiencies across digital regulations.

Third, strengthening international data policy and European data sovereignty by managing risks in cross-border data sharing while promoting cooperation with like-minded partners. This includes exploring tools such as trust labels, enhancing Europe’s role in global data governance, and considering new mechanisms such as global high-value data platforms.

He concluded by emphasizing the need for a balanced approach that supports innovation, regulatory clarity, and international collaboration.

5.4 Global address：Maiko Meguro (OECD)

Maiko Meguro (OECD) emphasized that technology and governance are no longer separate, but increasingly integrated, and that trust in the digital age requires a combination of rules, technology, and organizational mechanisms. This perspective underpins the concept of Data Free Flow with Trust (DFFT), which promotes cross-border data flows while addressing challenges such as privacy, security, and intellectual property.

She explained that DFFT focuses on two key dimensions: access control (ensuring secure and authorized access to data) and control of use (governing how data is used after sharing). Since data can be replicated, effective governance requires mechanisms that ensure compliance beyond initial access.

To operationalize this, DFFT highlights three core elements—rules, technology, and organization—which together enable trusted data sharing. Data spaces were presented as practical environments where these elements are implemented, though challenges arise in cross-border contexts due to differing legal frameworks and the need for interoperability.

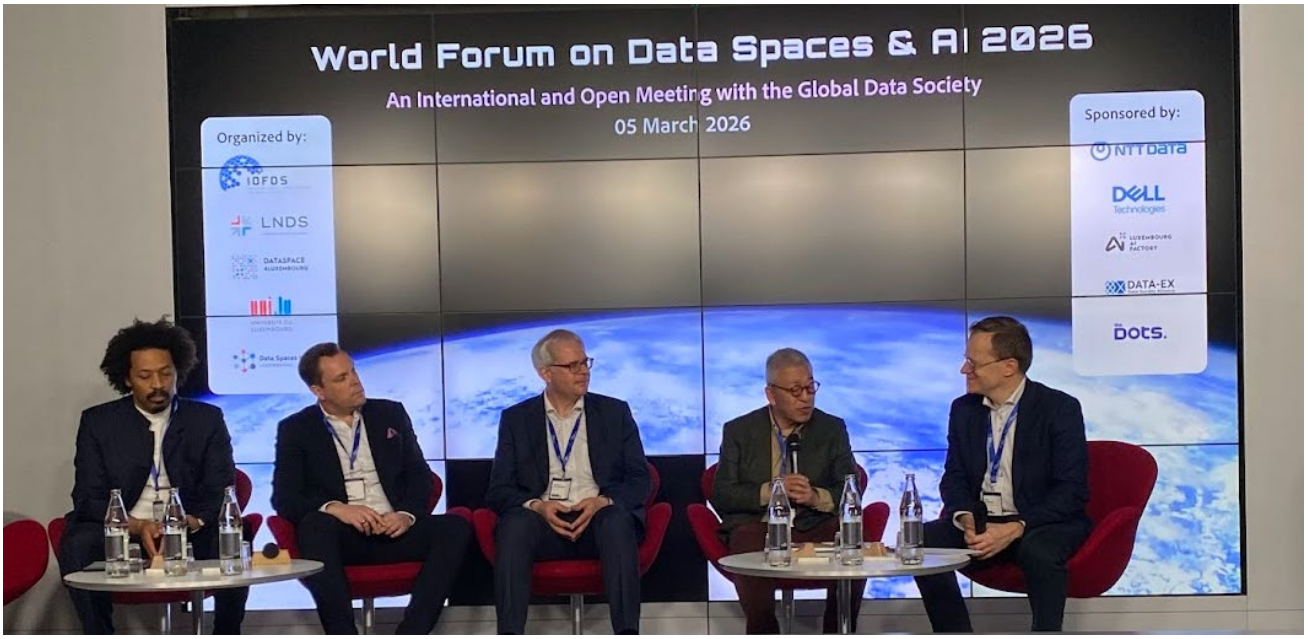
Meguro also noted that different stakeholders—regulators, businesses, and individuals—face distinct challenges in data governance, and that bridging these perspectives requires evidence-based, cross-disciplinary analysis, a role undertaken by the OECD.

She introduced ongoing OECD work under the G7-endorsed Institutional Arrangement for Partnership (IAP) to advance DFFT, including working groups on privacy-enhancing technologies and trust and integrity. These efforts aim to develop practical use cases and frameworks to support trusted cross-border data sharing.

She concluded by highlighting the importance of understanding how data spaces function across jurisdictions as a key issue for future data governance discussions.

6 Panel: Global data space developments – a roundtrip

Moderator: Bert Verdonck (LNDS)
Panelists: Lars Nagel (IDSA), Hiroshi Mano (IOFDS), Dominik Rohrmus (Catena-X), Christian Reimsbach-Kounatze (OECD)



The panel discussed the current state and key challenges of global data spaces from policy, industry, and international perspectives.

Mano presented IOFDS as an open and inclusive global forum for data collaboration, emphasizing the importance of common definitions and standardization. He highlighted the need for trust mechanisms, such as data notarization, to address the intangible nature of data, ensure authenticity, and enable governance and valuation. He also pointed to challenges in cross-border data exchange due to differing regulatory frameworks, stressing the need for common ground.

Rohrmus, from an industry perspective, emphasized that data sharing is essential for industrial automation and supply chain transformation. He highlighted Catena-X as a leading example of globally scalable, open, and standardized data spaces driven by market adoption. Key challenges include monetization and business models, particularly in managing intellectual property, as well as reducing operational costs and establishing data spaces as sustainable infrastructure.

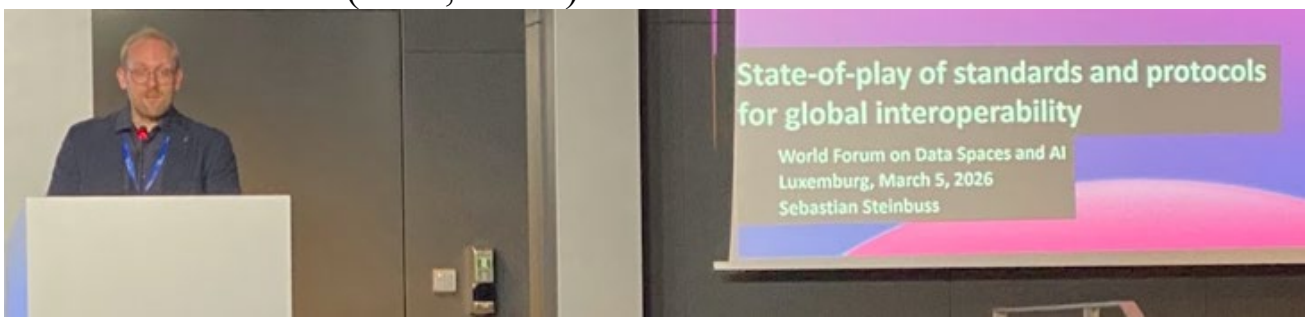
Nagel explained that data spaces emerged to enable trusted data sharing through mechanisms such as usage control, allowing data owners to define and enforce usage conditions. He described data spaces as a fundamental shift in data sharing and identified scaling as the main challenge, emphasizing the need to make data spaces as accessible and seamless as the internet, especially for SMEs.

Reimsbach-Kounatze focused on balancing data sovereignty and data sharing, framing sovereignty as control rather than protectionism. He noted that effective data sharing requires mechanisms addressing both legal and economic concerns, including intellectual property protection and incentives. He also emphasized that data availability alone is insufficient, highlighting the importance of capabilities and awareness to ensure value creation.

Overall, the panel converged on the view that data spaces are evolving into a global, trust-based infrastructure requiring standardization, scalable and economically viable models, and mechanisms to balance openness with control, alongside efforts to ensure effective data utilization.

7 Theme: Standards Development

7.1 Keynote: Towards Global Standards for Data Space Protocols, Sebastian Steinbuss (CTO, IDSA)



Sebastian Steinbuss provided an update on the state of data space standardization, emphasizing that global interoperability requires not a single standard but a comprehensive set of coordinated standards.

He highlighted ongoing international standardization efforts, particularly ISO/IEC 20151 on data space concepts and characteristics, which is nearing publication. This foundational standard is complemented by work on use cases and emerging trust frameworks. In parallel, technical specifications such as the Dataspace Protocol and Decentralized Claims Protocol are progressing toward international standardization, providing implementable interoperability mechanisms.

From the European perspective, he noted significant progress in harmonized standards on trusted data transactions, as well as related work on data quality, interoperability, governance, and maturity models. These efforts are increasingly aligned with international standardization, contributing to a shared global understanding of data spaces.

Steinbuss emphasized that a data space is defined as a governed environment enabling trusted data sharing based on agreed policies, standards, and protocols. He further outlined that data spaces must be understood across multiple dimensions—technical, economic, and governance/legal—which must be addressed both independently and in an integrated manner.

He also stressed key concepts such as data sovereignty, interoperability, and trusted data sharing, as well as the importance of mechanisms like usage control, multi-level policy enforcement, and the role of a “data rights holder” in defining conditions for data access and use.

Finally, he introduced the concept of data products, combining data, metadata, and services, and noted that future work will focus on managing the growing complexity of policies and automating compliance. He concluded that standardization is progressing well globally, with strong alignment between European and international efforts, but that continued work is needed to support scalable and interoperable data spaces.

7.2 Keynote: Trust Frameworks for the Global Economy, Christoph Strnadl (CTO, Gaia-X)

Christoph Strnadl (CTO, Gaia-X) presented Gaia-X's approach to enabling trust in digital ecosystems, emphasizing that beyond standardization, the key challenge is the operationalization of trust through implementable frameworks and software.

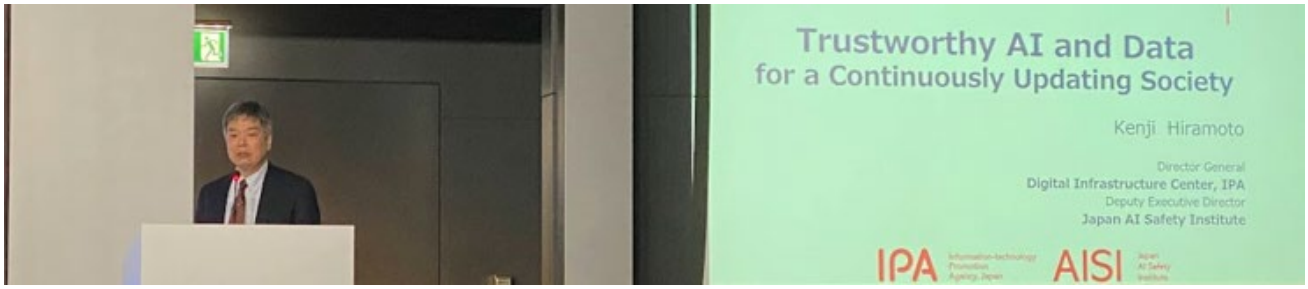
He introduced the Gaia-X Trust Framework as the core deliverable, which provides a structured approach to establishing trust through governance rules agreed upon by ecosystem participants. Recognizing the diversity of domains, he highlighted the shift toward a "bring your own rules" approach, allowing different ecosystems to define their own trust requirements while maintaining interoperability within a broader framework.

He stressed that trust must be automated to scale, particularly in large ecosystems with many participants, making manual management infeasible. However, this leads to a "cross-ecosystem trust dilemma," as different data spaces may adopt distinct trust mechanisms, certification schemes, and service providers, requiring participants to operate across multiple frameworks.

To address this, Gaia-X is developing concepts such as ecosystem trust profiles and meta-registries, enabling the discovery, evaluation, and potential mutual recognition of trust mechanisms across ecosystems. In the long term, automated interoperability between trust registries is envisioned.

He concluded by emphasizing that the next challenge is adoption, which depends on collaboration and co-innovation, and ultimately on building mutual trust across ecosystems, noting that trust must be actively created rather than assumed.

7.3 Keynote: Trustworthy AI and Data for a continuously updating society. Kenji Hiramoto (Japan AI Safety Institute & Digital Infrastructure Centre, IPA)



Hiramoto emphasized that the central question in the AI era has shifted from “whether AI can be used” to “whether AI can be trusted,” highlighting the growing importance of trust amid increasing reliance on AI and concerns over incorrect outputs.

He noted that traditional trust mechanisms based on fixed criteria (e.g., brand, certification) are no longer sufficient in a rapidly evolving technological landscape. As AI technologies advance at a faster pace, regulatory frameworks must be updated accordingly, leading to broader changes in business, society, and required skills.

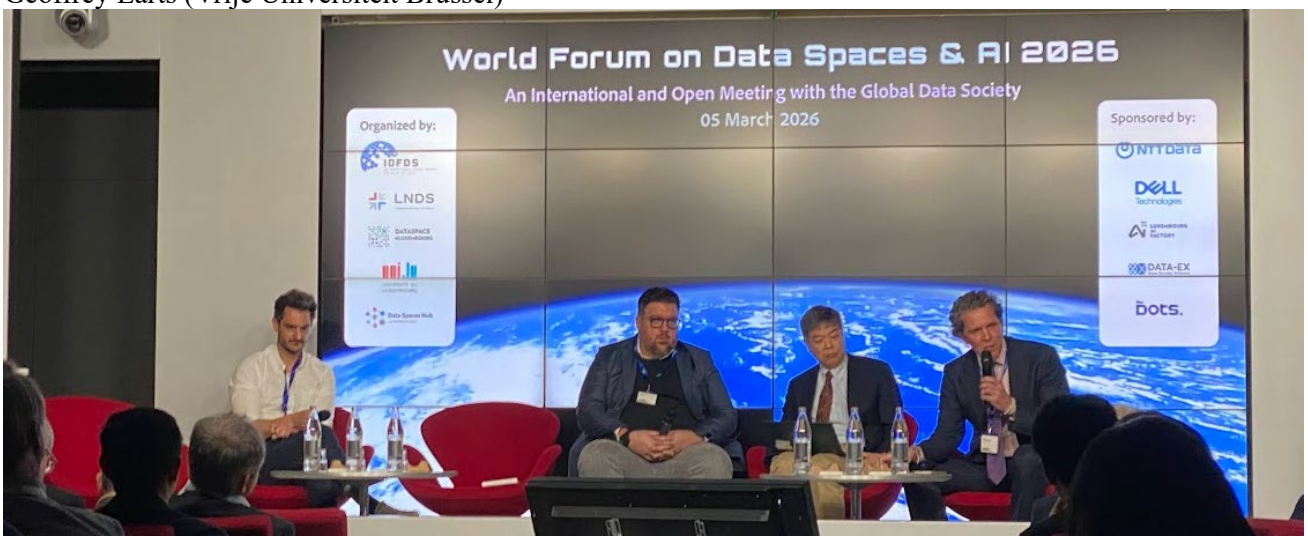
He outlined four key perspectives for trustworthy AI: explainability, fairness, safety/robustness, and accountability, and stressed the need to address trust not only at the technical level but also through broader social and governance mechanisms.

Hiramoto also highlighted the importance of “AI-ready data,” including structured and integrated data, proper data cleaning, metadata and lineage, and governance measures such as anonymization. He noted ongoing efforts by the Japanese government to establish data quality management frameworks.

Finally, he emphasized the need for reliable data platforms supported by both public data infrastructure and private-sector data markets, as well as the importance of balancing global collaboration with localization in addressing differing regulatory and cultural contexts.

7.4 Panel: Responsible AI across cultures and nations – a dialogue between Japan and Europe

Moderator: Marc De Bourcy (Luxembourg Ministry of Foreign and European Affairs)
Panelists: Kenji Hiramoto (Japan AI Safety Institute), Sylvain Kubler (SnT, University of Luxembourg), Geoffrey Earts (Vrije Universiteit Brussel)



The panel examined responsible and trustworthy AI from Japanese and European perspectives, focusing on governance approaches, implementation challenges, and the role of data spaces.

Marc De Bourcy framed the discussion by highlighting the growing risks associated with AI, including misuse, bias, security threats, and societal impacts, and emphasized the increasing difficulty of ensuring effective governance as AI development accelerates. He clarified the distinction between responsible AI (process), trustworthy AI (outcome), and trust in AI (user perception), positioning these as complementary but distinct concepts.

Kenji Hiramoto explained that Japan has adopted a hybrid approach combining hard law and soft law, noting that flexible guidelines are essential given the rapid pace of technological change. He emphasized the effectiveness of government-issued guidance in Japan, the importance of transparency mechanisms such as the OECD AI Process Reporting Framework, and ongoing work in ISO standardization, including joint certification schemes. At the same time, he highlighted the challenge that policy development often lags behind emerging technologies. Regarding data spaces, he stressed the importance of global interoperability, standardization, and metadata—including data quality and usage conditions—as key enablers for trustworthy AI.

Geoffrey Earts outlined the European perspective on trustworthy AI, referring to the European Commission's ethics guidelines and their requirements, including robustness, transparency, fairness, accountability, privacy, and environmental considerations. He emphasized the need for continuous evaluation of AI systems and introduced technical approaches to assess trustworthiness. He also highlighted that data spaces contribute directly to responsible AI through data sovereignty, controlled access, and traceability, supporting both governance and accountability.

Sylvain Kubler focused on implementation challenges, noting that while frameworks such as the EU AI Act provide important guardrails, particularly for high-risk systems and fundamental rights protection, companies face difficulties due to regulatory complexity and lack of simplification. He argued that competitiveness challenges in Europe are also linked to broader ecosystem factors such as limited venture capital. He further emphasized that responsible AI must be addressed end to end, including data governance, model robustness, and human factors such as skills and AI literacy, highlighting FARI's role in supporting technical, regulatory, and educational aspects.

Overall, the panel highlighted that responsible AI requires a combination of governance frameworks, technical solutions, transparency, and human capacity-building, while data spaces play a key role as infrastructure enabling trusted, controlled, and accountable data sharing across organizations and borders.

8 Opening Remarks: Michael Mossal (NTT Data)

Michael Mossal welcomed participants to the Data Spaces Symposium and expressed his regret at not being able to attend in person due to travel commitments. He thanked the organizing team and key partners, including IOFDS and the Luxembourg government, for their contributions in making the event possible. He also highlighted Luxembourg's role in hosting the symposium and supporting international collaboration.

Concluding, he emphasized that investments in data spaces and AI have proven to be a sound strategy, noting that the event has grown into a global platform for exchange and cooperation.

9 Theme: Global Manufacturing, AI and Supply Chains

9.1 Keynote: International Manufacturing-X for the global markets, Dominik Rohrmus (IMX)

Dominik Rohrmus outlined the vision of International Manufacturing-X, which aims to operationalize data spaces at industrial scale and generate tangible business value. He emphasized that while many concepts and technologies have been developed over the past decade, the current priority is their real-world deployment.

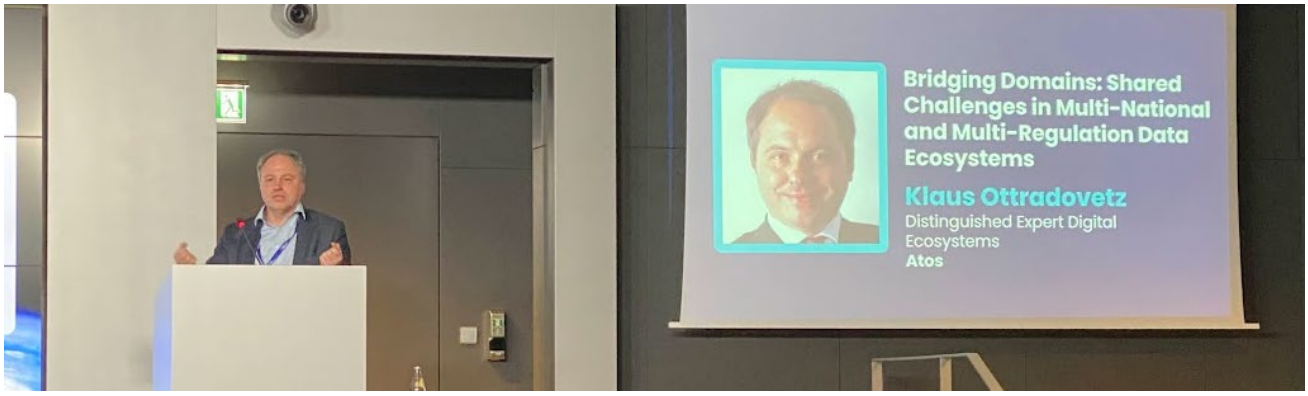
He highlighted key global challenges driving this effort, including supply chain resilience, the transition to a circular economy, and increasing international competition. To address these, he stressed the importance of global collaboration among initiatives in Europe, the United States, Japan, and beyond, as well as the critical role of standards—particularly semantic interoperability—to enable effective cross-border data exchange.

Rohrmus described a layered approach, with regulatory compliance forming the foundation of trust, followed by a common technological base built on shared standards, and finally domain-specific business use cases across sectors such as energy, manufacturing, and supply chains. He emphasized that while industries differ, they should share common infrastructure and standards to avoid fragmentation.

He also underlined the importance of concrete use cases across the product lifecycle, including circular economy applications, and noted that data spaces can significantly improve industrial productivity by enabling greater automation and more efficient use of assets.

Finally, he highlighted key developments such as the Digital Product Passport and industrial AI, noting that manufacturing AI will largely operate at the edge and requires trusted data-sharing infrastructures. He concluded by pointing to ongoing European initiatives as important steps toward advancing data spaces and industrial AI.

9.2 Keynote: Bridging Domains – Shared Challenges in Multi-National and Multi-Regulation Data Ecosystems, Klaus Ottrodevetz(Atos)



Klaus Ottradovetz presented a practical showcase demonstrating how data spaces, trust frameworks, and standards can be integrated across domains, geographies, and regulatory environments. The objective is to enable cross-border data sharing while ensuring authorization, usage control, trust, and interoperability.

Using the lifecycle of an electric vehicle battery as an example, he illustrated how multiple interconnected data spaces span raw materials, manufacturing, logistics, vehicle integration, operation, and recycling. This lifecycle involves global supply chains, diverse industries, and continuous data generation, supported by mechanisms such as digital twins and Digital Product Passports.

He emphasized that real-world implementation requires integrating different national systems (e.g., Europe, Japan, Korea) and enabling data exchange across heterogeneous industrial and IT environments, including legacy systems. AI and automation play a role in processing data across these interconnected systems to improve efficiency and decision-making.

A key challenge is the coexistence of multiple regulatory frameworks and domain-specific architectures. Rather than full harmonization, he proposed a minimal common technological core that connects diverse ecosystems through a “one-to-many” architecture, allowing local adaptations while ensuring interoperability.

He also highlighted the importance of decentralized trust, where each region maintains its own trust services while enabling mutual recognition of identities and credentials across systems based on shared standards.

The showcase demonstrated that, through a limited set of common standards and mechanisms, cross-ecosystem interoperability can be achieved in practice, linking data spaces, trust frameworks, and industrial applications into a coherent system.

9.3 Keynote: AI-RoboticsDC – Industrial deployment of AI-driven, remotely operated robotic maintenance systems for data centres, Meysam Minoufekr (Dropslab Technologies)

Meysam Minoufekr introduced the AI Robotics DC initiative, focusing on the deployment of AI-driven and remotely operated robotic systems for data center maintenance. He emphasized the broader industrial challenge of ensuring execution accuracy and traceability, moving from procedure-based work to verifiable, data-driven operations.

He presented an approach that digitally maps human work processes using AI-assisted guidance and augmented reality, enabling step-by-step validation, traceability, and compliance. This system generates structured execution data, which supports debugging, continuous improvement, and training of AI systems.

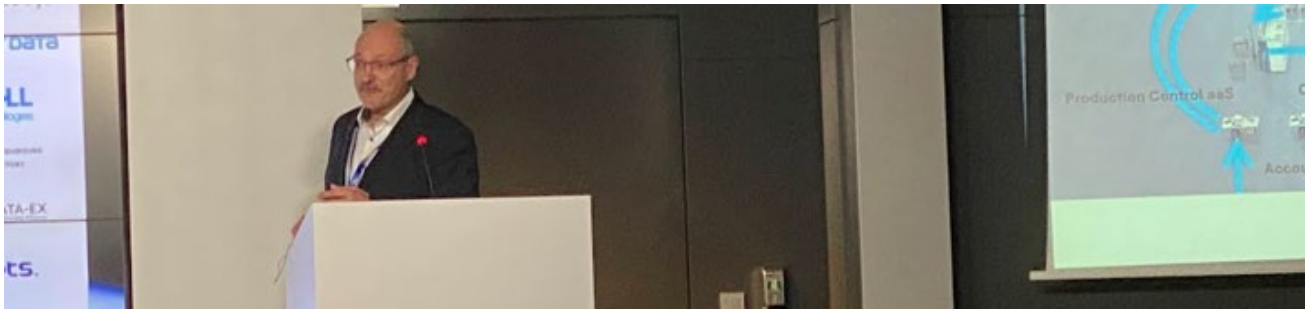
Building on this, he outlined the transition toward robotic execution, particularly in environments such as data centers where safety, accessibility, and operational constraints make remote or automated operations advantageous. In this model, human experts remain involved but can supervise operations remotely without requiring robotics expertise.

Minoufekr highlighted key challenges in current AI and robotics deployments, including lack of transparency, unclear accountability, intellectual property risks, and regulatory compliance concerns. He argued that these issues are particularly critical in multi-stakeholder and cross-border environments.

He proposed data spaces as a solution, enabling controlled and selective data sharing, governance, and auditability across organizations. Through policy-based access, verification mechanisms, and traceability, data spaces can support safe and compliant robotic operations.

He concluded that large-scale automation requires strong governance, emphasizing that mapping processes, enforcing rules, and ensuring accountability are essential to enable safe and scalable deployment of AI and robotics systems.

9.4 Keynote: Relevance of data spaces in machine manufacturing, Ingo Sawilla (TRUMPF)



Ingo Sawilla explained how data spaces and AI are transforming machine manufacturing and enabling the transition toward smart factories. He emphasized that future industrial production will be based on close integration of machines, software, data, and AI.

He described TRUMPF's shift from a traditional product-based business model toward a service-oriented model, where machines are offered as production services. This transition enabled deeper insights into real factory operations and highlighted the importance of data-driven ecosystems in optimizing production.

He presented use cases such as remote operation of machines, including "night shift as a service," where machines can be operated and supported remotely to maintain productivity. Looking ahead, he noted that AI will significantly scale operations, allowing a single operator to manage large numbers of machines.

Sawilla highlighted key enabling technologies, including connectivity, secure data exchange, edge computing, and data ecosystems. He also described AI applications such as automated parameter optimization and predictive maintenance, which improve efficiency and reduce downtime.

He concluded that data spaces combined with AI enable new business models, advanced services, and continuous optimization of industrial processes, ultimately enhancing productivity and competitiveness in manufacturing.

9.5 Panel: The global stance on data spaces for manufacturing and supply chains

Moderator: Masaru Dobashi (IDSA)
Panelists: Meysam Minoufekr (Dropslab Technologies), Ingo Sawilla (TRUMPF), Dominik Rohrmus (International Manufacturing-X), Laurent Lafaye (Dawex)

The panel explored the value and challenges of data spaces in manufacturing and supply chains from global and practical perspectives.

Masaru Dobashi framed the discussion by highlighting that manufacturing is a key pillar of data spaces, including in Japan, where data sharing already exists but involves highly confidential information. He emphasized the need for secure data-sharing infrastructure, the importance of demonstrating clear economic value, and the necessity of scaling data spaces globally while maintaining regional diversity. He also pointed to challenges such as the diversity of data (including non-public and multimodal data) and the need to avoid creating new data silos.

Laurent Lafaye emphasized that the primary value of manufacturing data spaces lies in breaking data silos and enabling knowledge sharing across distributed industrial operations. Using global manufacturing examples, he highlighted use cases such as cross-plant knowledge sharing and real-time monitoring of energy consumption and carbon emissions. He stressed that these use cases deliver both operational and business value. For scaling, he identified cost and onboarding complexity as key barriers and argued that SMEs require affordable, plug-and-play solutions with automated compliance.

Ingo Sawilla focused on the economic and organizational challenges of adoption. He noted that while no single technical barrier exists, companies hesitate due to uncertainty around value, complexity, and internal readiness. Drawing on TRUMPF's experience, he highlighted the shift toward service-based models and the resulting need for high-quality data, new billing models, and organizational transformation. He stressed that clear economic incentives are essential and that companies must actively engage rather than wait.

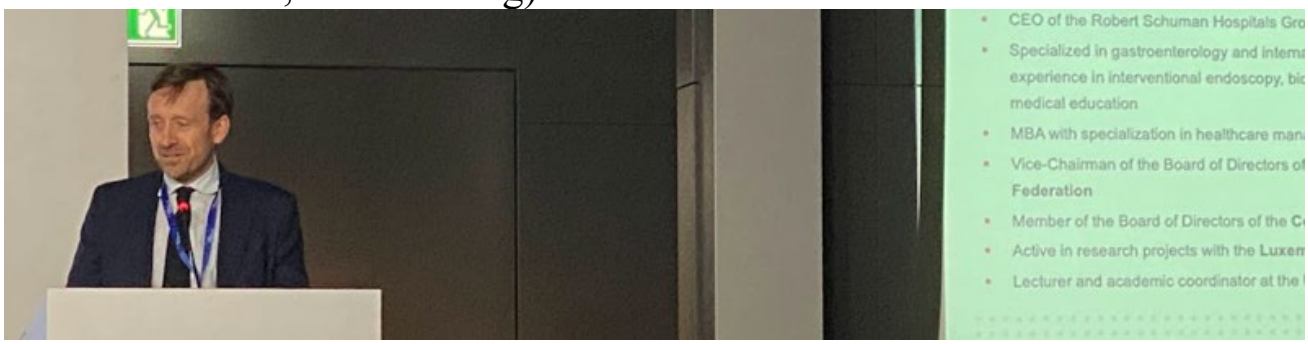
Dominik Rohrmus emphasized the importance of infrastructure, standards, and interoperability, noting that many SMEs still lack basic digital systems, making data integration difficult. He stressed that industrial adoption depends on stable standards rather than evolving concepts. For scaling, he highlighted the need for low-barrier entry points and operational platforms that reduce complexity and cost, enabling broader participation while maintaining global interoperability.

Meysam Minoufekr focused on trust, data governance, and economic concerns, noting that companies often hesitate to share data due to risks related to intellectual property and cost transparency. He emphasized the need for mechanisms that allow selective data sharing while protecting sensitive information and highlighted the importance of supporting diverse and multimodal data in real industrial environments. He also pointed to the emerging importance of governing physical AI and robotics, where data spaces can provide safety and control.

Overall, the panel converged on the view that while data spaces offer clear value in improving efficiency, transparency, and sustainability, large-scale adoption depends on reducing cost and complexity, ensuring interoperability, building trust, and clearly demonstrating economic value, particularly for SMEs, while enabling global connectivity without losing regional diversity.

10 Theme: Global Health Care

10.1 Keynote: Clinical Impact of Data Spaces, Dr. Marc Berna (Hôpitaux Robert Schuman, Luxembourg)



Marc Berna presented the clinical relevance of data spaces in healthcare, highlighting both the opportunities and current limitations in using clinical data. Drawing from hospital practice, he noted that large volumes of data are generated through diagnostics, interventions, and robotic-assisted procedures, but their effective use remains constrained by issues of data availability, data quality (often unstructured or incomplete), and regulatory barriers.

He introduced the Data Space for Health initiative as an approach to address these challenges by enabling secure, high-quality, and legally compliant data sharing for both clinical practice and research. He emphasized that improved data access and integration could enhance diagnosis, treatment personalization, disease understanding, and preventive care.

Two use cases were highlighted. The first focused on diabetes, where real-world clinical data were combined with external data to build digital twin models, supporting personalized treatment and risk prediction. The second addressed precision oncology, particularly in the context of molecular tumor boards, where complex clinical and genetic data need to be shared and analyzed to guide treatment decisions.

He also introduced a new project on dementia and neurodegenerative diseases, involving international collaboration, including partners from Japan. This project aims to enable cross-border analysis by making heterogeneous clinical data (including unstructured and imaging data) interoperable and comparable.

Berna concluded that data spaces can play a key role in making healthcare more data-driven and collaborative, particularly by enabling international data exchange and supporting clinically meaningful applications.

10.2 Keynote: Ulf Nehrbass (Luxembourg Institute of Health (LIH))

Ulf Nehrbass presented the role of data spaces in advancing translational medical research, emphasizing the shift from traditional molecular approaches to the use of real-world clinical data. He highlighted that meaningful medical innovation requires not only access to patient data but also data standardization, quality, and interoperability, which remain key challenges.

He introduced the Luxembourg Research Clinic and the Clinnova initiative as platforms connecting hospitals and research institutions across Europe, aiming to integrate clinical and research data. These efforts focus on harmonizing data and enabling cross-border collaboration, supported by frameworks such as GDPR, the European Health Data Space (EHDS), and Gaia-X. He noted that decentralized data architectures—where data remain local and are analyzed remotely—are becoming a core design principle.

Nehrbass emphasized Luxembourg's role as a testbed for cross-border health data spaces, including expansion toward international collaboration, such as with South Korea. He highlighted the importance of connectors and interoperability technologies to enable scalable and secure data exchange across institutions and countries.

He explained that generating value from data spaces requires the integration of connectivity across institutions, the ability to conduct coordinated clinical studies across networks, and the availability of high-quality, structured data. Among these, he stressed that data quality is particularly critical, noting that unreliable or poorly structured data can undermine AI and knowledge generation. He also emphasized the need to integrate diverse data types beyond genetics, including lifestyle and clinical data, and highlighted the importance of prospective studies to generate reliable datasets.

He concluded that combining these elements within data spaces can significantly improve medical research and patient outcomes, and that collaboration between public institutions and industry will be essential to translate data-driven insights into real-world healthcare impact.

10.3 Panel: AID-Care – International collaboration on research of neuronal diseases leveraging data spaces and AI for health data exchange between Japan and Europe

Moderator: Amal Tawakuli (NTT DATA Inc.)
Panelists: Venkata Satagopam (University of Luxembourg), Masaru Dobashi (NTT DATA Group, IDSA), Muhammad Shoaib (NTT DATA), Jean-Paul Steinmetz (ZithaSenior S.A.)

The panel discussed the AID-CARE project, focusing on the use of data spaces and AI to enable secure, cross-border health data sharing between Japan and Europe, particularly in the field of neurodegenerative diseases.

Amal Tawakuli moderated the session by introducing AID-CARE as a project addressing the challenge of utilizing sensitive and fragmented healthcare data, particularly unstructured data, and guided the discussion on how AI and data spaces can enable safe and effective data use.

Muhammad Shoai explained that AID-CARE builds on the previous Data Space for Health initiative and aims to validate data-sharing concepts in a concrete disease domain through international collaboration. He emphasized two key objectives: improving data-sharing processes using AI—particularly in regulatory and procedural steps—and applying data spaces to real clinical questions. He also highlighted the importance of transforming unstructured clinical data into structured formats and integrating stakeholders across hospitals and care providers.

Venkata Satagopam focused on technical challenges, particularly the predominance of unstructured and multilingual data in healthcare. He emphasized the role of AI, including large language models, in structuring such data and enabling interoperability. He also highlighted federated learning as a key approach, where algorithms are sent to data rather than moving data, ensuring data sovereignty while enabling cross-border analysis.

Jean-Paul Steinmetz provided the perspective of long-term and home care, emphasizing that valuable patient data exist outside hospitals. He highlighted the importance of integrating longitudinal and contextual data—such as daily activities, psychological conditions, and behavioral patterns—into clinical analysis. He argued that such “real-life” data provide a more accurate and holistic understanding of patients and can support early detection and prevention.

Ulf Nehrbass emphasized the importance of public–private collaboration, noting that while public institutions generate valuable clinical data, private-sector involvement is essential to translate research into practical healthcare solutions. He stressed that demonstrating clear value is key to attracting private investment and enabling innovation.

Masaru Dobashi highlighted the strategic importance of international collaboration, particularly between Japan and Europe, and emphasized that AI fundamentally changes the role of data as a core resource. He stressed the need for collaboration across regions and domains due to the limited and heterogeneous nature of healthcare data. He also pointed to the importance of common data models and standards, as well as ongoing efforts to establish cross-border testbeds and institutional collaboration.

Overall, the panel agreed that enabling secure, interoperable, and AI-driven data sharing—while preserving data sovereignty—is essential for advancing healthcare research and innovation, and that international collaboration and multi-stakeholder integration are key to achieving this goal.

11 Theme: Progress in Other Domains

11.1 Keynote: The AI-Native Bank – Innovate Without Losing Control, Amal Tawakuli (NTT DATA)

Amal Tawakuli (NTT DATA) presented a live demonstration showcasing how AI agents can be developed and deployed in highly regulated environments such as banking. Her central message was that financial

institutions can innovate with AI while maintaining strict control over data privacy, security, and regulatory compliance.

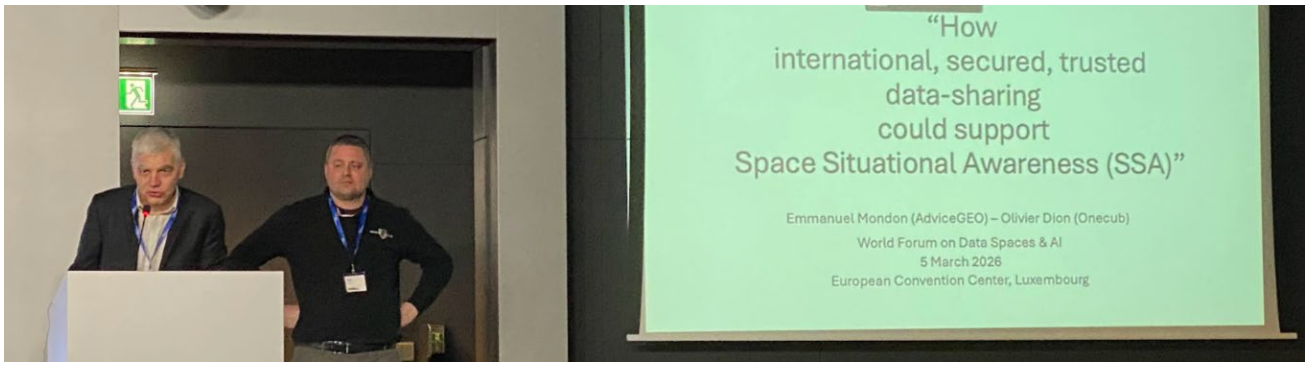
She first outlined key challenges faced by the banking sector, including stringent regulatory requirements (e.g., data lineage, auditability), high expectations for data privacy and security, and the difficulty of integrating AI models—often perceived as "black boxes"—into compliant systems. These challenges highlight the need for solutions that combine AI capabilities with robust governance and control mechanisms.

To address this, she introduced a full-stack approach enabled through collaboration between NTT DATA and AI technology partners, offering sovereign, on-premise AI environments where large language models can operate securely within controlled infrastructures.

The core of the presentation was a live demo in which she created an AI agent for wealth management advisory within minutes. The agent was configured with domain-specific roles, expertise, structured response formats, and strict guardrails to prevent data leakage and ensure compliance. The demonstration showed that the agent could generate structured investment advice based on client data while adhering to defined constraints, including refusing to respond when data was unavailable—thereby avoiding hallucination.

The presentation illustrated how AI agents can be tailored to enterprise needs, integrating internal data sources, real-time information, and governance rules. It emphasized that combining AI with secure infrastructure and well-defined control mechanisms enables practical and compliant AI adoption in sensitive domains such as finance.

11.2 Joint Keynote: Securing Europe in Orbit – Space Situational Awareness and Data-Driven Coordination, Emmanuel Mondon (Space Cooperative Europe SCE) and Oliver Dion (Onecub)



Emmanuel Mondon and Oliver Dion presented how secure and trusted data sharing can support space situational awareness and the broader space ecosystem. They emphasized that space activities—ranging from Earth observation and navigation to telecommunications and defense—are becoming increasingly critical across multiple sectors, making reliable data exchange essential.

Emmanuel Mondon highlighted key challenges in space operations, particularly the growing complexity of space traffic management and the risks posed by space weather and orbital congestion. With the rapid increase in satellites and the presence of both public and private actors, ensuring safe and sustainable use of space requires continuous monitoring and coordination. He stressed that no single country or organization can address these challenges alone, making international data sharing a necessity. This, in turn, requires robust governance frameworks, collaboration between civil and defense stakeholders, and trusted mechanisms to handle sensitive data.

Building on this, Oliver Dion introduced the concept of a “space data space,” aiming to transform existing space data initiatives into interoperable, governed data space frameworks. He noted that while Europe is strong in open space data, it lags in value-added services and business development, highlighting the need for better data utilization. The proposed blueprint, developed with ESA and multiple international partners, promotes secure data sharing with controlled access and interoperability across sectors.

The keynote concluded that establishing trusted, interoperable data spaces in the space domain is essential not only for operational safety and efficiency but also for unlocking economic value and enabling cross-sector collaboration.

11.3 Keynote: Understand and Improve Deep Neural Networks for Space and Ground, Fabrizio Pastore (University of Luxembourg)

Fabrizio Pastore (University of Luxembourg, SnT) presented research on improving the reliability and explainability of deep neural networks (DNNs) used in safety- and mission-critical systems, including space applications. He emphasized that while DNNs are widely used for complex tasks such as object recognition and planetary surface mapping, ensuring their correctness is essential, as failures can have serious consequences.

He highlighted key challenges in validating DNNs, particularly the gap between simulated and real-world data and the high cost of generating sufficient test scenarios. To address this, his team developed an approach that combines simulation, generative models, and evolutionary algorithms. Simulated data are transformed into more realistic inputs using generative techniques, while evolutionary algorithms efficiently identify critical test cases that expose weaknesses in the models. This enables cost-effective “worst-case” testing and supports targeted retraining.

In addition, he introduced methods to analyze and interpret failure scenarios. By clustering similar failure cases and extracting patterns, the approach helps identify conditions under which DNNs are likely to fail. These insights can then be used to improve model robustness and guide retraining processes.

The keynote demonstrated that combining testing, optimization, and explainability techniques is key to ensuring trustworthy AI systems, particularly in high-risk domains such as space and autonomous systems.

11.4 Joint Keynote: The relevance of data spaces for defence, Alban Schmutz (Cloud Data Engine) and Angel Ivanov (NTT DATA)

Alban Schmutz (Cloud Data Engine) and Angel Ivanov (NTT DATA) presented the role of data spaces in the defense sector, highlighting both the complexity and strategic importance of secure data sharing across European nations. They emphasized that defense represents one of the most challenging environments for data spaces due to fragmented national systems, strict legal constraints, and deeply rooted sovereignty considerations.

Alban Schmutz outlined the unique characteristics of the European defense landscape, where 27 countries operate under different legal frameworks, regulations, and operational practices. This creates significant barriers to data sharing, despite the need for coordination in areas such as logistics and joint operations. He also highlighted a fundamental "security paradox" in defense: the tension between the need to share information for collaboration and the need to restrict access for security reasons. To address this, he stressed the importance of "interoperability by design," including automated compliance with diverse legal and operational rules.

Angel Ivanov complemented this perspective by focusing on the technical paradigm shift required. Rather than centralizing sensitive data, he emphasized a federated "compute-to-data" approach, where data remain within national boundaries while analytics are executed locally. This enables the use of sensitive data without direct sharing, supporting applications such as predictive maintenance, operational coordination, and logistics optimization.

The speakers also introduced ongoing European initiatives, including the development of a defense AI data space under the European Defence Agency. This effort aims to create a distributed, resilient, and data-centric architecture capable of handling highly sensitive and dynamic information across multiple stakeholders.

The keynote concluded that the defense domain serves as an "extreme case" for data spaces, driving innovations in decentralization, security, and governance that can also benefit other sectors, particularly in areas such as supply chains and cross-border collaboration.

11.5 Keynote: How Data Spaces Support Trading and Financial Market Operations, Yoshiharu Akahane (Payment Planning Group, NTT DATA)

Yoshiharu Akahane (NTT DATA, Payment Planning Group) presented a new “value transfer layer” concept designed to complement data spaces by integrating economic mechanisms such as payments, incentives, and transferable rights. He argued that while current discussions on data spaces focus on data exchange and trust frameworks, the economic layer—how value moves alongside data—is often missing.

He introduced a token-based architecture in which trust is embedded directly within digital tokens through cryptographic signatures. This enables secure, direct wallet-to-wallet transfers of tokenized value without relying on centralized platforms. The approach allows value, data, and associated rules (e.g., usage conditions or compliance requirements) to move together across systems, organizations, and even AI agents or IoT devices.

Akahane emphasized several key capabilities of this model, including traceability of transactions, programmability of rules, interoperability across systems, and the elimination of intermediary bottlenecks. He highlighted its relevance for emerging digital currencies, cross-border transactions, and complex supply chains, where current systems remain fragmented and inefficient.

The concept has been explored in collaboration with the Bank of Japan and tested in practical use cases such as local government programs. He also noted its potential for AI-driven environments, where autonomous agents require efficient, machine-to-machine value exchange.

The keynote concluded that embedding trust within tokenized value and enabling decentralized transfer mechanisms can support more efficient, interoperable, and economically sustainable data space ecosystems.

11.6 Panel: Driving global adoption of data spaces in space, finance and defence

Moderator: Amal Tawakuli (NTT DATA)
Panelists: Yoshiharu Akahane (Payment Planning Group), Nasir Zubairi (LHoFT), Emmanuel Mondon (Space Cooperative Europe SCE & AdviceGEO), Alban Schmutz (Cloud Data Engine)

The panel discussed how to drive the global adoption of data spaces across finance, space, and defense, focusing on sector-specific challenges, common enablers, and differences.

Amal Tawakuli opened the discussion by highlighting that, unlike healthcare, the value of data spaces is less obvious in sectors such as finance, where data are highly sensitive and rarely shared. She framed the discussion around understanding why data spaces are needed despite such constraints.

Nasir Zubairi (LHoFT) took a cautious stance on finance, emphasizing that financial institutions are inherently restrictive and unlikely to share sensitive customer data. He further noted that the adoption of AI in finance remains limited, largely due to a lack of understanding and reliance on legacy thinking and processes. He stressed the need for education and practical demonstrations to unlock adoption.

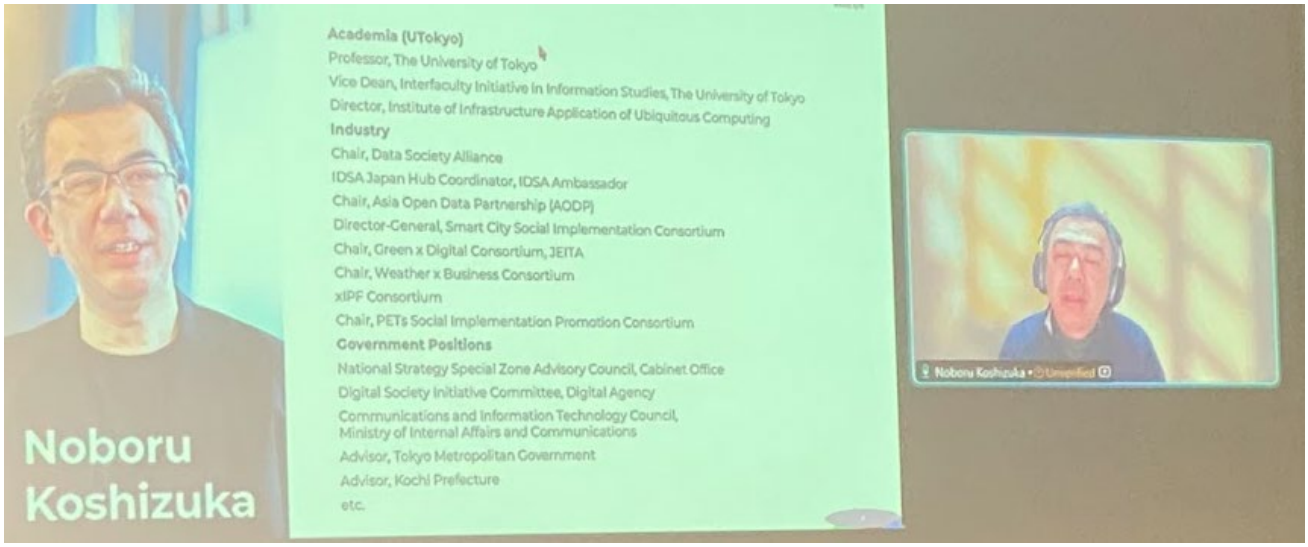
Yoshiharu Akahane (NTT DATA) provided a more positive perspective on finance, highlighting concrete use cases such as supply-chain finance and data-driven decision-making. He argued that data spaces can enhance visibility across organizations and support better credit assessment and operational decisions. He also emphasized the importance of integrating economic mechanisms, suggesting that finance and data spaces are mutually dependent.

Emmanuel Mondon (Space Cooperative Europe / AdviceGEO) explained that in the space sector, the need for data spaces varies by domain. In manufacturing and supply chains, data spaces are already relevant and developing, driven by the need to coordinate complex ecosystems. In contrast, downstream data services remain less mature, lacking strong ecosystem leaders and clear business models. He emphasized that common technical components already exist, and the focus should be on interoperability and domain-specific integration.

Alban Schmutz (Cloud Data Engine) focused on defense and cross-sector perspectives, identifying two key factors for adoption: technological readiness and ecosystem organization. He highlighted the need for advanced capabilities such as decentralized architectures and zero-trust mechanisms, as well as the importance of onboarding all ecosystem participants, including SMEs. He also stressed that while technology can be shared, each sector requires its own “rulebook” defining governance and data-sharing conditions.

Across the discussion, participants agreed that while core building blocks—such as interoperability, trust frameworks, and governance mechanisms—are largely common, the key differences lie in sector-specific rules, business models, and levels of ecosystem maturity. The panel concluded that successful adoption depends not only on technology but also on aligning incentives, improving understanding, and developing practical use cases tailored to each domain.

11.7 Keynote: Intelligent and sustainable cities – A glimpse into the future, Noboru Koshizuka(University of Tokyo)



Noboru Koshizuka (University of Tokyo) presented a conceptual framework for the future of smart cities, proposing “urbantics” as an overarching principle that integrates data spaces, AI, and urban systems. He argued that smart cities should not be seen merely as a collection of technologies, but as complex socio-technical systems requiring a unified analytical framework.

Drawing inspiration from cybernetics, he introduced urbantics as a discipline that studies the principles of intelligence, control, and interaction within cities. This concept encompasses various technologies such as IoT, AI, data spaces, and urban infrastructure, positioning cities as “intelligent systems” rather than simple technological aggregations.

He highlighted practical implementations in Japan, including data-driven urban services such as real-time transportation visualization, human flow analysis, disaster response, and smart infrastructure management. These examples demonstrated how data spaces and AI can support more efficient and sustainable urban operations.

Looking ahead, he emphasized the evolution toward distributed and federated AI integrated with data spaces. In this vision, AI systems operate collaboratively across domains, enabling federated learning and reasoning while maintaining data sovereignty, security, and trust. He noted that combining AI with data spaces can create a new form of intelligence capable of leveraging both open and sensitive data in real time.

The keynote concluded that integrating AI and data spaces under the concept of urbantics can enable intelligent, sustainable cities, representing a key direction for future digital and urban innovation.

12 Closing words, Hiroshi Mano(IOFDS Chair) and Bert Verdonck(LNDS)

Hiroshi Mano (IOFDS Chair) closed the meeting by briefly introducing ongoing initiatives in Japan related to data spaces, including efforts toward data trading frameworks and standardization. He also highlighted IOFDS activities, noting regular biannual meetings and monthly alignment sessions, and invited participants to the next in-person meeting planned in Tokyo.

Bert Verdonck (LNDS) concluded by thanking all speakers, participants, and organizing teams for their contributions. He emphasized the value of the discussions and exchanges during the event and encouraged continued collaboration among participants.

Reported by Isamu Yamada, IOFDS Secretary