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International Manufacturing-X Council Showcase: Make data work at the Edge and DPP

Nuremberg, Germany – November 25th 2025 – IMXC Showcase Executive Summary

The International Manufacturing-X Council (IMXC) initiative represents a pivotal effort to address the pressing need for global data collaboration and interoperability in the manufacturing sector preparing future industrial AI innovations. As industries worldwide face increasing complexity and competition, the ability to seamlessly exchange data internationally with security and trust in a sovereign way becomes crucial. Moreover, trust is key, for making manufacturing data work and flow across the manufacturing supply chain. IMXC aims to enable a collaborative partnership with the mission to facilitate open, federated, global, and cross-industry data ecosystems. IMXC is driven by 13 national initiatives. To demonstrate the potential of this interconnected international approach, the IMXC Showcase highlights the tangible benefits of data interoperability and federated, secure and sovereign industrial data ecosystems. The use cases span across various industrial manufacturing verticals. Two business cases and one support use case are demonstrated: Edge Data Management Vertical Integration as well as Data Space Horizontal Integration for Dynamic Carbon Footprint Calculation and the Industrial Data Space Enabling Services - the Federated Trust technology. The IMXC Showcase highlights the significant value of industry-standardized, interoperable data exchange and demonstrates that an automated flow of manufacturing data can be realized with minimal integration effort among partners across the world.

Nuremberg, Germany – November 25th 2025 – Press Release The International Manufacturing-X Council (IMXC) initiative represents a pivotal effort to address the pressing need for global data collaboration and interoperability in the manufacturing sector preparing future industrial AI innovations. Particularly, as industry address the development and deployment of industry-grade AI models and solutions for automation. As industries worldwide face increasing complexity and competition, the ability to seamlessly exchange data internationally along the supply chains as well as factories with security and trust in a sovereign way becomes crucial. Moreover, trust is key, for making manufacturing data work and flow from devices via the edge to the cloud and across the supply chain. This is a challenge that no country, initiative, or company can achieve alone. IMXC aims to enable a collaborative partnership with the mission to facilitate open, federated, global, and cross-industry data networks. This approach enables companies of all sizes to thrive in a digitally connected manufacturing data ecosystem.

IMXC is driven by several national initiatives represented by important stakeholders, including Australia, Austria, Belgium, Canada, France, Germany, Greece, Italy, Japan, South Korea, Spain, The Netherlands, and the USA. Each country contributes, fostering pre-competitive collaboration in full accordance to anti-trust regulations that benefits the entire manufacturing sector internationally. By focusing on a federated data ecosystem, IMXC supports the development of

sustainable, resilient, and competitive industrial solutions. This collaboration is essential for tackling global challenges, as it allows for the harmonization of standards and the creation of trustworthy data ecosystems.

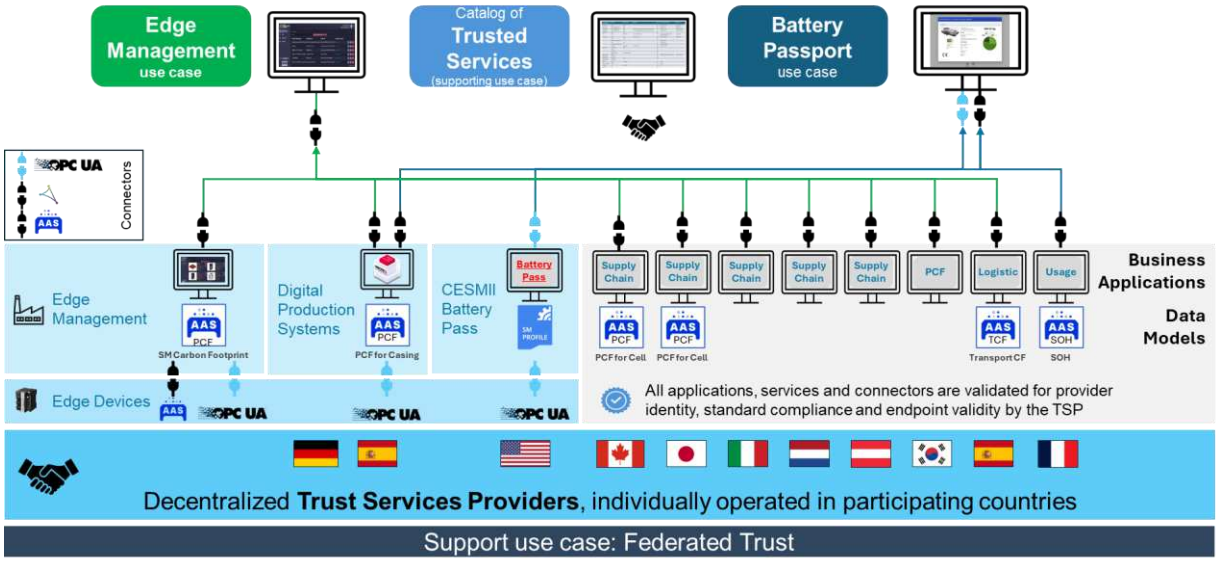
To demonstrate the potential of this interconnected international approach, the IMXC Showcase highlights the tangible benefits of data interoperability and federated, secure and sovereign industrial data ecosystems. The use cases span various industrial manufacturing verticals, illustrating how sovereign data sharing can drive innovation, improve efficiency, boost competitiveness and support climate-neutral production. By validating these concepts through real-world applications, IMXC aims to inspire broader adoption and investment in data-driven smart manufacturing technologies.

The success of IMXC is based on the active participation of leaders and decision-makers from the public, private and academic sectors. By fostering continuous dialogue and collaboration, the initiative aims to shape a future where manufacturing is not only more competitive but also more equitable and environmentally conscious. This collective effort underscores the importance of global cooperation in addressing the challenges and opportunities of a data-driven digital age.

IMXC Showcase Introduction

The IMXC Showcase, powered by LNI 4.0 and its members, demonstrates cross-country and inter-company vertical and horizontal data exchange based on industry standards and federated trust. Interoperability is achieved through modern data space and digital twin technologies. Two business cases and one support use case are demonstrated at the fair. The Edge Management business case fosters the integration of the shopfloor in the data ecosystem and the Digital Product Passport (DPP) use case is being created during the manufacturing of a battery and continuously enriched with additional data from various companies along the supply chain.

All participants adhere to internationally recognized standards such as the Asset Administration Shell (AAS), OPC UA (CS), and the CESMII Smart Manufacturing Profiles (SMP). As announced during the Hannover Messe 2025, the IMXC Showcase realizes the interoperability collaboration between OPC UA and AAS, as well as the integration of data space technologies. Data space connectivity is based on the Eclipse Dataspace Working Group protocols for data spaces and Eclipse Dataspace Components (EDC), while using their respective IT environments. The DPP provides detailed information about the product itself and its key components from a global supply chain spanning Austria, Germany, Greece, Italy, France, Japan, Korea, the Netherlands, Spain, and the USA. The automation of cross-ecosystem and cross-border trust is adapting the concepts of the Gaia-X Trust Framework.



The IMXC Showcase and its Use Cases

Outlook of the IMXC Showcase

Data is crucial for AI. In the manufacturing context, data is heterogenous, highly distributed across stakeholders and needs to be ready for use from the edge to the cloud and across the full lifecycle. Moreover, manufacturing data is valuable as it is often related to company IP and knowledge that has been generated over many years. Hence, agile, sovereign and trusted access to data becomes essential for AI-powered optimisation of intelligent production workflow automation and supply chain operation. The IMXC Showcase demonstrates how manufacturing data spaces become a key enabler for vertical and horizontal integration of data value chains. The IMXC illustrates for the first time, industry effectively making data work with trust internationally where it is needed (from the edge to the cloud), when it is needed (across the full product lifecycle and digital passport), with the stakeholders that are needed (across supply chains at a global scale) and from their own systems and platforms (interoperable identities & credentials).

IMXC Showcase - Edge Data Management Vertical Integration

Data spaces live on data as their key resource, and for industrial products this means that the industrial production process has to provide the data. Integrating data sources from industrial shop floors into a grander data ecosystem is typically achieved through the utilisation of edge devices. This business case deals with the interoperability of edge solutions for leveraging production data for the data space. A cross-vendor approach for the configuration of these critical

data sources is shown, based on AAS description of the devices involved in the demonstration. This living testbed is aimed at further improving the cross-vendor workability of edge solutions on an international scale.

IMXC Showcase - Data Space Horizontal Integration for Dynamic Carbon Footprint Calculation

One of the key innovations demonstrated is the dynamic calculation of the battery Product Carbon Footprint (PCF). The total PCF is the sum of the manufacturing-related carbon emissions of its individual components and the overall logistics processes. These values are updated continuously based on factors such as energy sources used in production or transportation routes.

In addition to the static DPP data, State of Health (SOH) information—such as current capacity and performance—is also continuously updated through additional international data spaces.

IMXC Showcase - Industrial Data Space Enabling Services: Federated Trust

Establishing trust across diverse regulatory and technological environments is paramount for secure and reliable data exchange. This enabling service of the IMXC Showcase demonstrates how IMXC promotes federated trust by enabling the interoperability of digital identities and credentials issued by various Trust Service Providers (TSPs). Specifically, TSPs from all participating countries collaborate to issue verifiable credentials according to their respective national frameworks based on an interoperable cross-ecosystem ontology. These credentials are then made discoverable and mutually verifiable through a common catalogue, creating a seamless mechanism for organisations to establish and confirm trust in manufacturing cross-border data transactions. This allows data producers and consumers to interact with confidence within the federated data ecosystem, safeguarding the integrity and authenticity of shared data. The implementation uses the Gaia-X Trust Framework.

Why is the IMXC Showcase important?

The IMXC Showcase highlights the significant value of industry-standardized, interoperable data exchange across global supply chains using federated trust. It demonstrates how a secure, trusted, federated, controlled, and automated flow of manufacturing data can be realized with minimal integration effort among partners across the world.

With this, global initiatives can validate interoperability in real-world industrial implementations, accelerating the realization of digitally connected federated industrial data ecosystems. The IMXC Showcase remains alive after the SPS 2025 fair and develops further towards the Hannover Messe 2026. For more details see www.imxc.org.

Statement of Thomas Hahn, Spokesperson of the IMXC Council

“Interoperability and trusted data exchange are the key enablers for the future of global manufacturing," says Thomas Hahn. "With the IMXC Showcase at the SPS 2025 fair, we demonstrate how international partners from government, industry, research, industry associations and other stakeholders from around the world collaborate on federated and secure industrial data ecosystems. The Digital Product Passport (DPP) is a crucial business case for sustainable and transparent industry applications. For the shopfloor integration the Edge Management enables future use cases. By integrating international industry standards such as AAS, OPC UA, CESMII SMP and EDC, we are setting an important milestone on the path to a connected, resilient, and competitive industry. We invite companies worldwide to join this initiative and actively shape the future of the industrial data ecosystems.”

Contact and Booth presentation

For further information and contact please refer to: www.imxc.org

Visit the **IMXC Showcase and its partners** live at the **SPS 2025** in **Hall 3** at **Booth 321** (November 25th to 27th)

Acknowledgment and Partners

The IMXC Showcase is realized by strong international partners. Our special thanks go to:

ATOS, ARVATO Systems, Catena-X Association, Catena-X Competence Center Spain, CESMII, Confindustria, Congatec, conplement, Data4Industry-X, Dawex, Engineering, EVIDEN, FESTO, Fujitsu, Gaia-X, Gaia-X Hub Austria, German Edge Cloud, Hilscher, IDTA, Innovalia, Kyungnam University, Labs Network Industrie 4.0 (LNI 4.0), Laboratory for Manufacturing Systems and Automation, micronex, Microsoft, Mitsubishi Electric, Nestfield, NTT, OPC Foundation, Orbiter, Plattform Industrie 4.0 Austria, Politecnico di Milano, Quantum Surf, RCEI, SM4RTENANCE, SQS, Siemens, SiMa.ai, Sovity, Standardization Council Industrie 4.0 (SCI 4.0), Smart Industry and Brainport Industries, Toshiba, T-Systems, University of Tokyo, Weidmüller and XITASO