

Towards a more resilient, sustainable and competitive manufacturing

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The industry is experiencing a significant evolution, primarily influenced by the integration of digital technologies, where the shift towards data-centric strategies is affecting nearly every aspect of the manufacturing value chain. Aiming for more efficient use of resources, optimisation of production processes, and the development of smarter, more connected products, the sector has also had to address sustainability challenges and CSR reporting, which can be complex to manage with organisations and shop floors spread across the globe.

In this rapidly evolving landscape, data exchange emerges as a game-changing force, facilitating the creation of robust data ecosystems and data spaces by enabling secure, compliant and trusted data exchanges among the entire industry value chain. By accelerating the circulation of data across all ecosystem stakeholders, data exchange is revolutionising how industries interact and collaborate, driving innovation and efficiency. The success of a company depends on its leaders' ability to see the big picture. In

traditional management this rarely happens. Most companies are a network of multiple entities and branches, with complex and troubled relationships. For a traditional management team, it's almost impossible to be fully informed. As a result, decisions are too often based on reports from team leaders, rather than on a 360-degree view of what is going on within the company. Data exchange technology allows to federate data spaces to cover many departments and functions, from resolving simple operational challenges to making strategic decisions for the future of the company. Over time, many sectors are increasingly recognising this versatility, making data a key element of the 4th Industrial Revolution, also known as the Industry of the Future.

In this overall context we launched Data4Industry-X, the trusted, secure, compliant and sovereign Data Exchange Solution for Industry. The ambition of Data4Industry-X is to address the industry challenge of data exchange in decentralised manufacturing, improving

efficiency and productivity, accelerating data-driven innovation, boosting competitiveness, minimizing the carbon footprint across the manufacturing value chain, while keeping control over the data produced locally and abroad. In doing so, Data4Industry-X ultimately fosters a compelling and sustainable European industry ecosystem, encompassing all sizes of organisations, by leveraging the full potential of broad cross-border, cross-company, cross-factory industrial data exchanges.

To address these challenges, a consortium was created with Schneider Electric, Valeo, CEA, Dawex and Prosyst bringing strong expertise in data exchange, production & manufacturing, shop floor and plant technologies: Connected products & captors, OTPaas, Industrial data formatting tools, Edge devices and control modules, Historian servers..., and Industrial applications, AI/ML.

To facilitate the interoperability between data spaces, Data4Industry-X solution aligns with Gaia-X principles and implements Gaia-X de facto standards. This led Data4Industry-X to be recognised as a Lighthouse Project by Gaia-X, demonstrating the compliance of the technology with the European value carried by Gaia-X. Therefore Data4Industry-X will more easily access the communities built by other lighthouse projects addressing other data spaces. Powered by Dawex Data Exchange technology, the Data4Industry-X solution is based on open and cloud-agnostic architecture, and will use the Eclipse Dataspace Component framework to facilitate interoperability between data spaces. Additionally, thanks to the UDC (Unified Data

Collector) Prosyst solution, Data4Industry-X interfaces with OPC UA protocol to retrieve industrial data and exchange them at scale with the broad ecosystem.

Additionally to support the broader objective of creating a compelling and competitive European industry, Data4Industry-X contributes to the Manufacturing-X ambition and interoperates with other Manufacturing-X initiatives such as Factory-X. Manufacturing-X is a European and international initiative designed to showcase, in a coordinated way, manufacturing data spaces in key industry sectors, across the entire production and supply chain. Manufacturing-X looks at bringing resilience, sustainability and competitiveness to the industry by leveraging secure, open and sovereign data exchange. Data4Industry-X is therefore a flagship project and key contributor to Manufacturing-X, to foster the emergence in the industry of data exchange initiatives and their valorisation in the form of services, therefore creating an attractive and sustainable industry ecosystem.

Data spaces and data ecosystems are evolving in a more and more regulated environment. As such, organisations engaging in data exchange need to comply with the European Data Governance Act, especially for use cases where data intermediation services are in place. Additionally, connected products manufacturers fall under the European Data Act requirements, and in particular related to the obligation of connected devices to make usage and contextual data available to the users of such connected devices or third parties designated by the connected product user. Both regulations, the Data Act

and the Data Governance Act, aim at facilitating access to data, removing silos, creating trust, fostering innovation and stimulating competition. Data4Industry-X complies with the DGA and the DA, offering industry stakeholders a secure, traceable and compliant data exchange solution to address their challenges. Other EU legislations such as the Corporate Sustainability Reporting Directive (CSRD) can be addressed with Data4Industry-X by helping large companies to continuously and reliably collect information to publish regular reports on their environmental and social risks and impacts. In a current example, by improving the monitoring of CO2 emissions and the plans to minimise them. More recently, the new EU EPR regulation is making data spaces indispensable. As a matter of fact, the Ecodesign for Sustainable Products Regulation (EPR) imposes the DPP (Digital Product Passport) for some products as early as 2027, such as batteries, and will be generalised later for all products. The DPP therefore requires data exchange between organisations that may belong to different sectors.

A large variety of impactful industry use cases are addressed by Data4Industry-X, in sectors such as:

- **Automotive industry** - Address environmental objectives requires to facilitate data consolidation at group level, and foster interoperability between plants & partners. The Data4Industry-X solution demonstrates useful impatriation of all data from plants across the world, keeping the decision making in France while reinforcing the company's efficiency.
- **Power generation industry** - Improve default detection and predictive maintenance through semantic analysis and data normalisation automated by data exchange between AI models trained on large historical knowledge bases and industrial organisations.
- **Engineering and R&D** - Enable advanced

materials research through molecular mechanics simulations, and bring innovation for satellites, planes or car conception, thanks to improved modeling.

- **Supply chain traceability** - Enable the modeling of perturbations and the resilience of the supply chain, including stochastic forecasts and risk management, as well as increase the warehouse dynamic optimisation.
- **Production process optimisation** - Trigger process optimisation (robotics, performance, control, ...), improved demand forecast, refined customer requirements management, and enhanced carbon footprint management.

These apply to a wide range of sectors, including aerospace and defense, automation, energy and transportation. Impactful use cases are limitless, and more ambitious and innovative examples are emerging.

Industrial organisations with plants, shop floors and suppliers, spread across the globe with decentralised manufacturing, are concerned for their ability to bring innovations and operational efficiencies to increase competitiveness, while reducing CO2 emissions to meet and report on their sustainability obligations. The Data4Industry-X solution will bridge the entire industry data ecosystem by enabling large and small organisations in all sectors to exchange, distribute and valorise industrial data, securely, to ultimately improve operational efficiency and meet decarbonation objectives.

To learn more about Data4Industry-X, contact us on <https://www.data4industry-x.com>.

