PRESS RELEASE

Aachen, January 12, 2021

Using Data Sovereignly

WZL successfully implements secure Prototype for a decentralized, cross-enterprise IoT Data Space based on GAIA-X Model

The entire digitization of machines, plants and devices often leads to the creation of data silos within the company itself. However, data silos reduce the quality of data, hinder internal collaboration and slow down decision-making processes. This not only affects the usability of digital assets, but also the development of new insights into production processes, the reduction of decision latency and the increase in customer loyalty.

With the “GAIA-X” concept, the German government, and its European partners, have developed a proposal for the design of the next generation of a data infrastructure for Europe, which addresses the above-mentioned problems. GAIA-X aims at a secure and interconnected data infrastructure based on European values that meets the highest standards of digital sovereignty and promotes disruptive innovation. In an open and transparent digital ecosystem, data and services are to be made easily available, brought together and shared with confidence.

The MachineCloud has already been implemented in the new WZL Machine Hall and has been operating successfully since day one (© WZL)

With these goals as a guideline, the Chair of Manufacturing Technology at the Laboratory for Machine Tools and Production Engineering WZL at RWTH Aachen University, headed by Prof. Thomas Bergs, and senseering GmbH have realized their own interpretation of a decentralized, cross-company Internet of Things (IoT) data space under the provisional project name “MachineCloud”.

Laboratory for Machine Tools and Production Engineering (WZL) of RWTH Aachen University

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The MachineCloud enables the seamless exchange of heterogeneous IoT data sources inside and outside its own halls, which is why the three WZL sites distributed throughout the city of Aachen at Campus-Boulevard 30, Steinbachstraße 19 and Rotter Bruch 12 have been connected to it. The corresponding locations of the neighboring Fraunhofer Institute for Production Technology IPT at Steinbachstraße 17 have also been integrated. In addition to their connection to the IoT data space, each of the sites also receives software for visualizing and analyzing the data. The digital assets are thus securely accessible from anywhere and can also be used, viewed and evaluated remotely.

On all machines, a dashboard visualizes the sovereign and self-determined use of data, exemplified here by live PLC signals (© WZL)

Herman Voigts, a researcher at the Chair of Manufacturing Technology at the WZL, explains the advantages of such a cross-company and cross-location data room in the field of fineblanking:

> “Fineblanking is a highly productive process for mass production. However, the high fluctuation of tool life is responsible for the difficult planning of maintenance and the associated setup times. We are using the MachineCloud to increase precisely this plannability, to make better use of tool life and to avoid scrap production. In this way, we are tapping into a potential cost saving of 30 percent for industrial production. To do this, sensor data is loaded into the MachineCloud, networked and evaluated using innovative methods.”

All Machines and Devices in one digital Place

In accordance with the GAIA-X specifications, data acquisition and data storage are carried out sovereignly in the company's own network. Thanks to a decentralized architecture, the data owners have

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sovereignty over the use and release of their own data at all times. Using an intelligent catalog, all data located and released by other network actors in the network can be actively searched and found.

In addition, stakeholders can share their own data with other participants in a systematic and granular selected manner. For the first time, this enables the joint development of automated and data-driven services based on the shared data. New services are fed back via the IoT data space and thus made accessible to all actors. In the background, a Blockchain or distributed ledger technology (DLT) additionally secures the data integrity of any originator data throughout the system, thus ensuring seamless tracking of the validity of the data.

> "What seemed impossible until recently will now be commonplace: The joint development of AI services on different data sets from different stakeholders for maximum effectiveness in manufacturing supply chains," said Prof. Thomas Bergs, Executive Director of the WZL and Chair of Manufacturing Technology, who officially launched the MachineCloud at the end of November 2020.

The MachineCloud is currently in a pilot phase, which will conclude with the 30th Aachen Machine Tool Colloquium (AWK). On June 10 and 11, 2021, visitors to AWK'21 will be able to experience what it feels like to participate in a sovereign IoT data space according to GAIA-X guidelines and enter into dialog with the various players.

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Laboratory for Machine Tools and Production Engineering

The Laboratory for Machine Tools and Production Engineering (WZL) of RWTH Aachen University enhances the innovative strength and competitiveness of the industry with trend-setting basic research, applied re-search and the associated consulting and implementation projects in the field of production technology. In the research fields of manufacturing technology, machine tools, production engineering, gear technology as well as production metrology and quality management, practical solutions for rationalizing production are developed with industrial partners from a broad range of branches.