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Hannover Messe 2017: interconnected processes

Secure cloud platform connects production and IT

In collaboration with industrial partners and the Fraunhofer Group for Production, researchers at Fraunhofer IPA have created Virtual Fort Knox, an online marketplace that brings together manufacturing companies and providers of IT solutions. The hybrid cloud platform enables SMEs in particular to digitalize and design more efficient production flows and to develop new business models – very much in the spirit of Industrie 4.0. At Hannover Messe from April 28–24, the researchers will demonstrate the added value offered by a marketplace for industrial applications (Hall 17, Booth C18).

In Industrie 4.0, manufacturing meshes with state-of-the-art information and communications technology. The driving force behind this development is the rapidly growing digitalization of business and society. Many medium-sized plant and machinery manufacturers are asking themselves how they can get their companies in shape for Industrie 4.0 and enter the brave new world of digital production. This is where Virtual Fort Knox (VFK), a cloud solution for the manufacturing industry, comes in.

Researchers at the Fraunhofer Institute for Manufacturing Engineering and Automation IPA have developed this open, federative IT platform in cooperation with other industrial partners. Virtual Fort Knox AG (VFK) was spun out in 2015, and the Fraunhofer-Gesellschaft has been a partner since 2016. “The advancing digitalization of production calls for modular, flexible and vendor-neutral software solutions. With VFK, freely configurable apps make production data available on any type of end device. For this we utilize individual tools, machines and sensors. As an IT backbone for Industrie 4.0 solutions, VFK connects manufacturing companies with software providers and mechanical engineering companies,” says Joachim Seidelmann, head of the DigiTools for Manufacturing department at Fraunhofer IPA.

Value-added services

The portfolio of services covers big data as well as data evaluation, visualization, storage and production control. Solutions can be put together as needed and integrated into existing process flows. Manufacturing data is displayed according to the user's requirements. With little risk, users can quickly and flexibly assemble software solutions in the marketplace that perfectly match their production requirements.

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Software providers can combine their offers with those of other service providers, thus providing higher quality services and generating new business models (see also the box “How partners work together in the Virtual Fort Knox marketplace”).

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At the moment, numerous companies are preparing their products for the marketplace. “Right now, various partners carrying out some twenty research projects are using our version of the VFK platform, the VFK Research Platform, to implement proof-of-concept solutions,” explains Seidelmann about the current state of research. Virtual Fort Knox AG’s platform is currently being built up; it will drive the commercialization of VFK Research Platform results. The first independent software vendors (ISVs) are already integrating applications as services in the platform. Pilot applications have been put together at companies through a series of research projects.

New technology is not required

Companies do not require the latest technology to make their manufacturing operations cloud-enabled. Seidelmann and his colleagues will demonstrate how this works using four integrated showcases at the Application Center Industrie 4.0. Along with Future Work Lab and ARENA 2036, this application center is one of the most important development laboratories in the Stuttgart area. As an example, the researchers have fitted an analog lathe with additional sensors, making it possible to transmit production data to the cloud and incorporate the data into the digital workflow. The VFK Research Platform provides the IT backbone for this.

In the next step, the Fraunhofer Group for Production will roll out the VFK Research Platform as a shared, distributed group platform. At several different Fraunhofer Institutes – the Fraunhofer Institutes for Factory Operation and Automation IFF, for Production Technology IPT, for Machine Tools and Forming Technology IWU and for Mechatronic Systems Design IEM – individual instances of the platform are being installed and linked with the one at Fraunhofer IPA in Stuttgart to establish joint technological and organizational solutions, combine synergies and offer services for partners.

Virtual Fort Knox will play a central role at the Fraunhofer Booth at Hannover Messe (Hall 17, C 18). Not only will different demonstrators be connected over the platform, but the Fraunhofer Group for Production will present the integration of several Germany-wide Fraunhofer locations in the cloud solution. Just as it does in a real manufacturing environment, condition and process data flows into the system in near-real time and can be processed directly.

How partners work together in the Virtual Fort Knox marketplace

Via the Virtual Fort Knox (VFK) marketplace, manufacturing companies or end users obtain and use services from independent software vendors (ISVs) and assemble their customized solution. ISVs offer these services or create new ones based on offers from other ISVs – also known as aggregated services. Through the marketplace, customers and suppliers can form communities to evaluate services or exchange ideas about new functions or solutions.

End users can also become ISVs and offer solutions on the open platform. Virtual Fort Knox enables manufacturers to integrate their plants and industrial IoT devices in a secure dataspace via a manufacturing service bus (MSB). An MSB is a universal interface for connecting and integrating cyber-physical and digital tools, for example using OPC UA (see image 1).

Further information:

www.virtualfortknox.de/en/

www.produktion.fraunhofer.de/en

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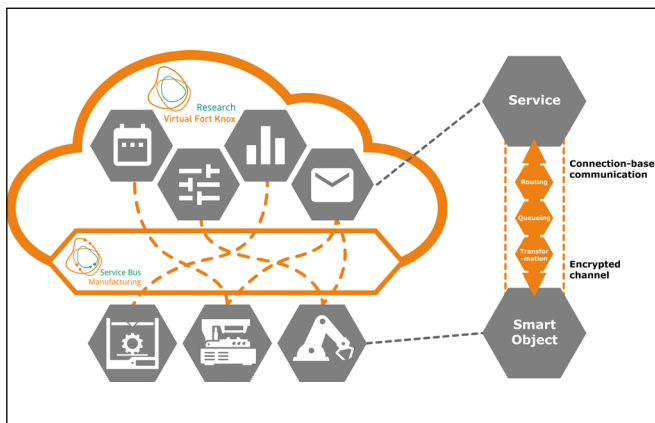
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As secure as Fort Knox

Protected by thick concrete walls, security guards and access codes, Fort Knox, in the State of Kentucky, is where the U.S. Treasury keeps its gold reserves. In Virtual Fort Knox, data is the precious treasure to be guarded. A highly sophisticated security concept protects the information transmitted from machines, plants and other cyber-physical systems in the factory to the cloud platform. The server is located in Germany. Companies can also operate VFK as a hybrid, private cloud platform. By virtue of these high standards, the VFK operators want to address the security concerns of medium-sized manufacturing companies that have been dismissive of previous cloud offers on account of the lack of transparency. Consistent IT support for this target group's business processes is contractually guaranteed.

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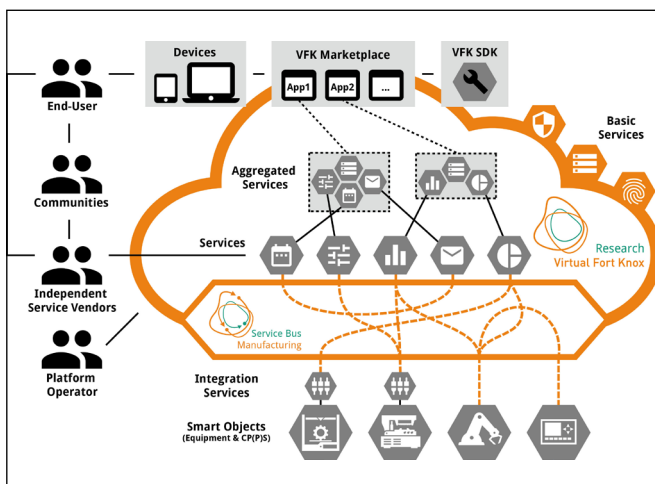
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The manufacturing service bus (MSB) is a universal interface for connecting cyber-physical and digital tools. © Fraunhofer IPA | Picture in color and printing quality: www.fraunhofer.de/en/press



Implementing the cloud IT platform takes just a few steps. © Fraunhofer IPA | Picture in color and printing quality: www.fraunhofer.de/en/press



The open VFK concept invites software providers and users to run services through the secure cloud. © Fraunhofer IPA | Picture in color and printing quality: www.fraunhofer.de/en/press

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