

News Release

FOR IMMEDIATE RELEASE

Hitachi develops secure resource sharing technology in collaboration with research institutes in Germany and Hungary

*Registered as a use case of the Japan-Germany IoT collaboration
for the realization of a sharing economy*

Tokyo, March 16, 2017 --- Hitachi, Ltd. (TSE: 6501, Hitachi) today announced the joint development of a resource sharing technology to flexibly share production facilities among enterprises with secure transfer of important information such as production quantity and machining process, with the Fraunhofer Institute for Manufacturing Engineering and Automation (“Fraunhofer IPA”) in Germany and the Institute for Computer Science and Control, Hungarian Academy of Sciences (“MTA SZTAKI”). This achievement was registered as a use case of the Japan-Germany IoT^{*1} collaboration^{*2} promoted by the Japanese Ministry of Economy, Trade and Industry (“METI”) and the German Federal Ministry for Economic Affairs and Energy (“BMWi”) to facilitate cooperation relating to IoT and Industrie 4.0.^{*3}

This use case will be introduced by the Robot Revolution Initiative^{*4} as an achievement of the collaboration between Japan and Germany at the “Digitising Manufacturing in the G20” conference to be held on the 16th and 17th March 2017 in Berlin, Germany, and “CeBIT” a leading global exhibition of digital business, to be held from 20th to 24th March 2017 in Hannover, Germany.

With the popularization of e-commerce in recent years, mass customization where customer needs change greatly over a short period of time has also advanced. As a result, there is a need in the manufacturing industry to address this diversification of customer needs and produce products in a timely manner. Conventionally, it was common for each company to invest in their own production facilities in accordance with peak demands, but this approach carries with it the potential issues of declining capacity utilization rate and ROA.^{*5} These issues are recognized as common to the Fourth Industrial Revolution which aims to enhance productivity and efficiency of production facilities by automation and connecting with the Internet, and solutions are being pursued worldwide.

At the Japan-Germany Summit Meeting in March 2015, the governments of Japan and Germany agreed to promote cooperation on the use of IoT in the manufacturing

industry and Industrie 4.0. Based on this agreement, METI and BMWi announced a joint statement to cooperate in activities related to international standardization, industrial security, and technology research & development, etc. in April 2016.

Prior to this, Hitachi has been participating in the IEC^{*6} Market Strategy Board “Factory of the future^{*7}” project from September 2014 and proposed a concept for a new production system “Crowd Manufacturing” based on the concept of a sharing economy.^{*8} “Crowd Manufacturing” supports both diversified customer needs and high utilization rate of production systems by enabling manufacturers to share production facilities on demand. This production system was proposed as a “Crowdsourcing Platform” in the IEC White Paper published in October 2015.

To verify the feasibility of “Crowd Manufacturing”, Hitachi, Fraunhofer IPA, and MTA SZTAKI developed secure resource sharing technology among production systems and production facilities of multiple enterprises by encrypting important information such as production quantity and machining process. Based on facilities usage contracts and production plans, the lender and borrower decide on important information to be encrypted, and the borrower encrypts the information. The encrypted information and other information necessary for production are transferred to the loaned production facilities, which temporarily connect to the production system, and are used for production. When the loan period for the facility expires, the manufacturing information is voided. Using this technology, it is possible to utilize the production facilities of other enterprises as if they were owned while maintaining confidentiality of manufacturing information and thus securely share production facilities.

Further, a testbed manufacturing environment emulating a production line was built together with an IoT industrial controller^{*9} with this technology. Interconnectivity tests were carried out between the manufacturing execution system and production facilities in this testbed environment, with promising results.

Hitachi will continue to pursue research & development activities under this Japan-German collaborative framework to realize “Crowd Manufacturing”.

*1 Internet of Things is name of technologies that expand the range of “things” connected to the Internet, going beyond the current scope of PCs, servers, and other IT devices.

*2 Industry-government-academia collaborative organization for promoting industrial IoT and robot utilization.

*3 National strategic project by German Government, aiming to advance the manufacturing sector. It is also referred to as “Fourth Industrial Revolution”.

*4 The Robot Revolution Initiative is aimed at promoting cooperation between industry, academia and government to utilize robots in various fields.

*5 Return on Asset

*6 International Electrotechnical Commission

*7 The Factory of the Future is the white paper published by IEC in 2015.

*8 Mechanism of economy which exchanges things, money, and services, realized by the development of social media.

*9 HX series distributed by Hitachi Industrial Equipment Systems Co., Ltd

About Hitachi, Ltd. (<http://www.hitachi.com>)

Hitachi, Ltd. (TSE: 6501), headquartered in Tokyo, Japan, delivers innovations that answer society's challenges. The company's consolidated revenues for fiscal 2015 (ended March 31, 2016) totaled 10,034.3 billion yen (\$88.8 billion). The Hitachi Group is a global leader in the Social Innovation Business, and it has approximately 335,000 employees worldwide. Through collaborative creation, Hitachi is providing solutions to customers in a broad range of sectors, including Power / Energy, Industry / Distribution / Water, Urban Development, and Finance / Government & Public / Healthcare.

About Fraunhofer IPA (<http://www.ipa.fraunhofer.de>)

With nearly 1 000 employees, Fraunhofer IPA is one of the largest institutes in the Fraunhofer-Gesellschaft. It has an annual budget of over 60 million euros, with more than one third coming from industrial projects. The 14 departments of Fraunhofer IPA are supplemented by six business units: Automotive, Machinery and Equipment Industry, Electronics and Microsystems, Energy, Medical Engineering and Biotechnology and Process Industry. This structure enables us to help our practice partners improve their market position as well as support their market entry into new application fields. The focus of our strategic initiatives is on sustainable projects with high industry participation.

About Hungarian Academy of Sciences (<https://www.sztaki.hu/>)

The Institute for Computer Science and Control, Hungarian Academy of Sciences (MTA SZTAKI) with nearly 300 full-time employees, including around 140 with scientific degree, was founded in 1964 as a research and development institution of Hungarian Academy of Sciences. The Institute gained worldwide reputation in computer science, informatics, control, discrete mathematics, robotics, advanced information systems and networking. SZTAKI realises also technology transfer to industry and service sectors including big international firms as well as SMEs. It is a full member of ERCIM (European Research Consortium of Informatics and Mathematics) since 1994, and "Centre of Excellence in Information Technology,

Computer Science and Control” of the EU since 2001

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