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## **Crowd Manufacturing for the Industrial Sharing Economy**

Forum Industry 4.0 meets the Industrial Internet

April 27<sup>th</sup>, 2017

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Automotive and Industry Laboratory at European Center for Social Innovation

Hitachi Europe GmbH

## Energy



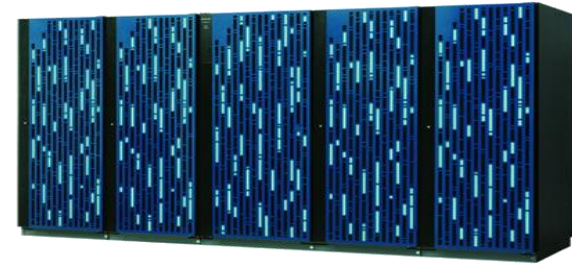
Wind Turbine

## Transportation



British CTRL Train

## Storage Systems



Disk Array Subsystem

## Building Systems



Intelligent Elevators

## Construction Machinery



Loading Shovel (80t)

## Medical Equipments



Open MRI System

Research collaboration on topics Crowd Manufacturing since 2015.

Hitachi Europe Ltd., Germany

Hitachi, Ltd., Japan

Fraunhofer Institute for Manufacturing Engineering and Automation (Fraunhofer IPA), Germany

Institute for Computer Science and Control, Hungarian Academy of Sciences (MTA SZTAKI), Hungary

Change,  
Risk

Inventory surplus-shortage due to market changes



Huge car stock yard

ROA  
gain

Surplus and shortage of capital investment

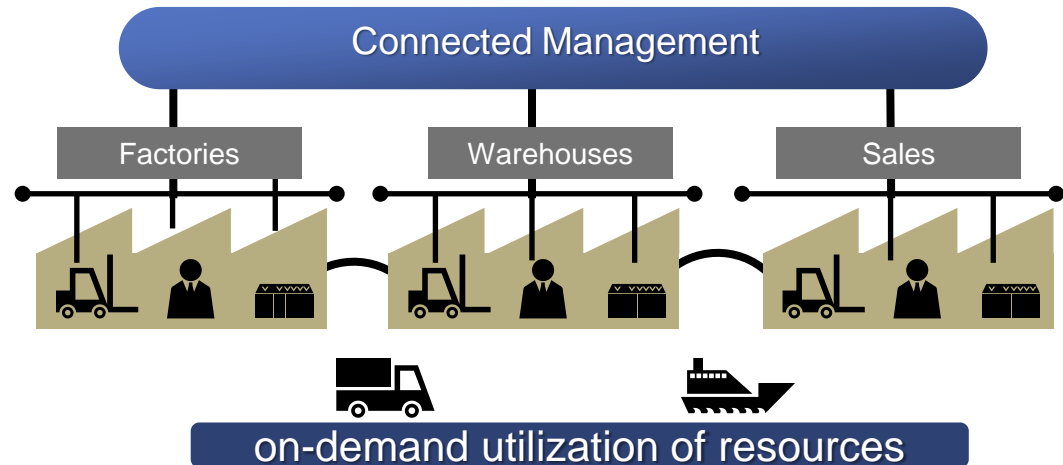
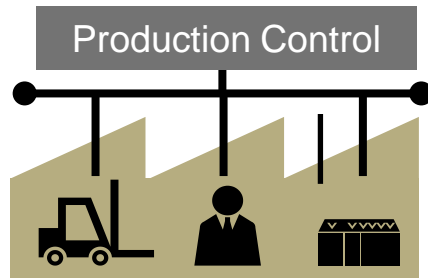
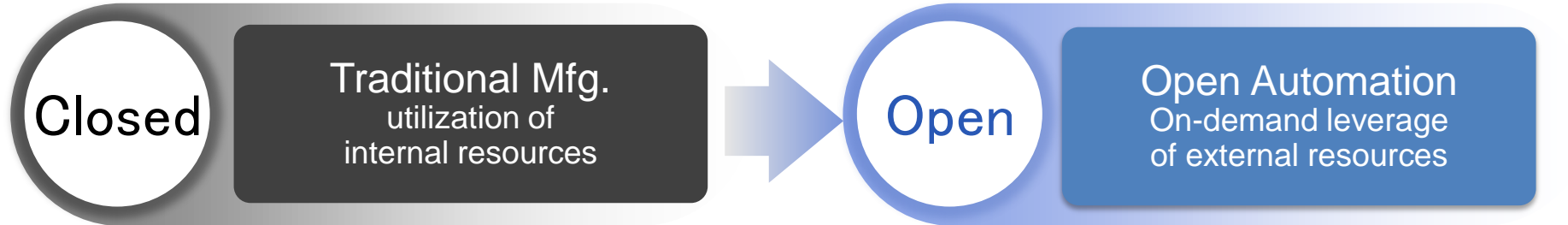
Capital Investment  
(Trillion Yen)



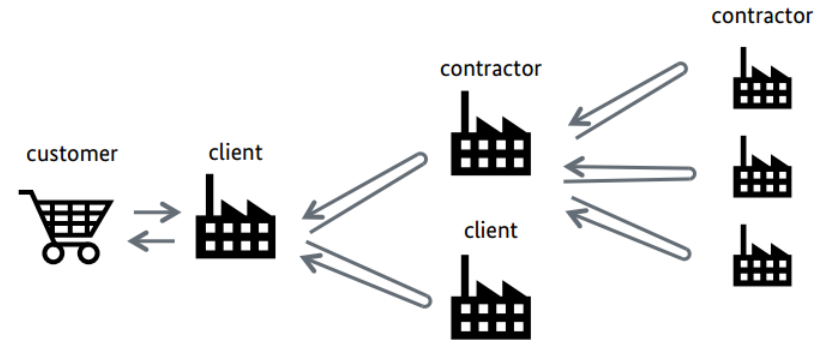
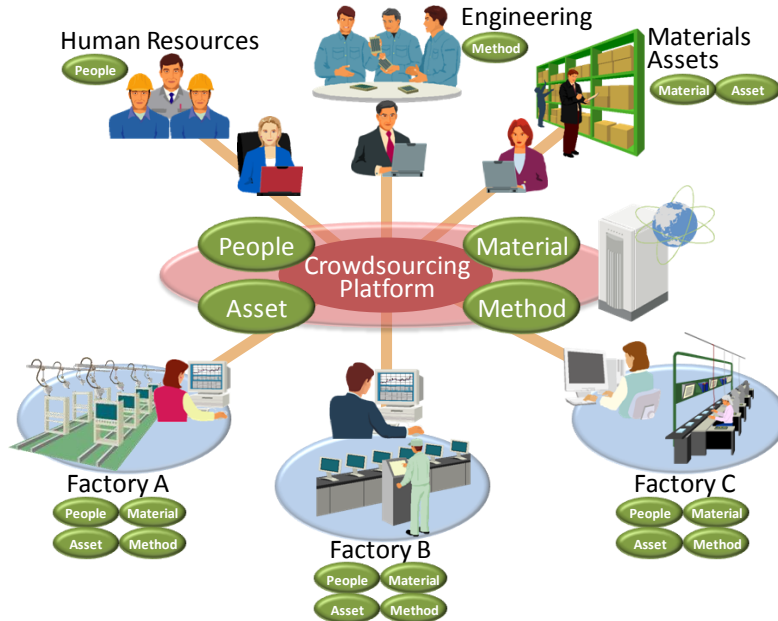
TTM

Realization time for physical products

Connect production resources of multiple factories and companies in an open environment, dynamically reconfigure and optimize the value chain



Symbiotic manufacturing society to exchange production resources and their related information between companies for on-demand production



IEC market Strategy Board “Factory of the future”:  
Image of next generation manufacturing

Source: <http://www.iec.ch/whitepaper/futurefactory/>

Platform Industry 4.0 Application scenarios “Order-  
Controlled Production” value creation network

Source: Plattform Industrie 4.0

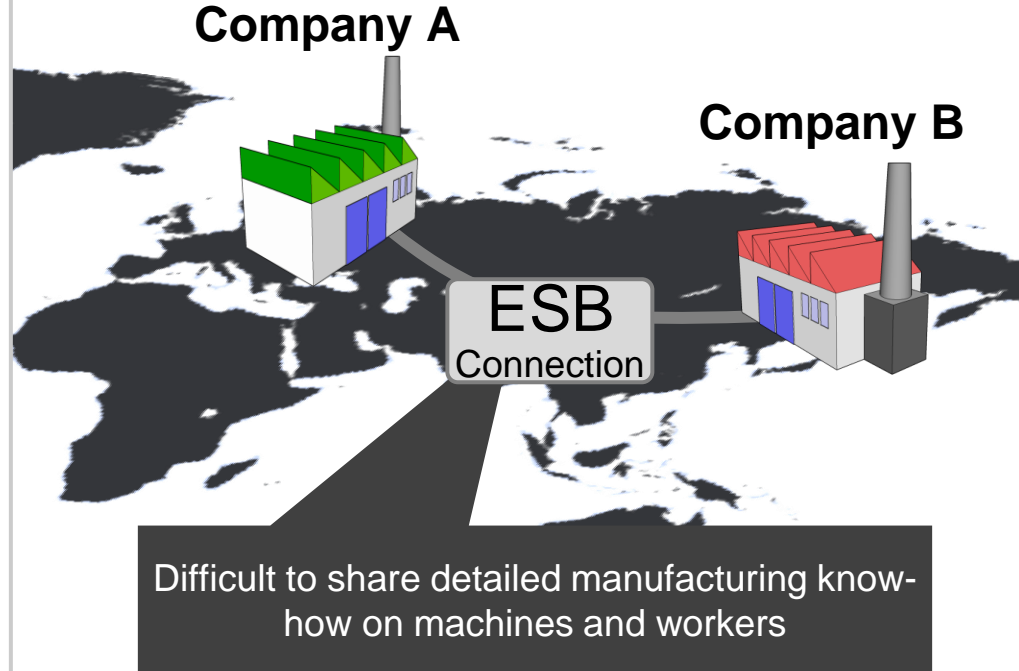
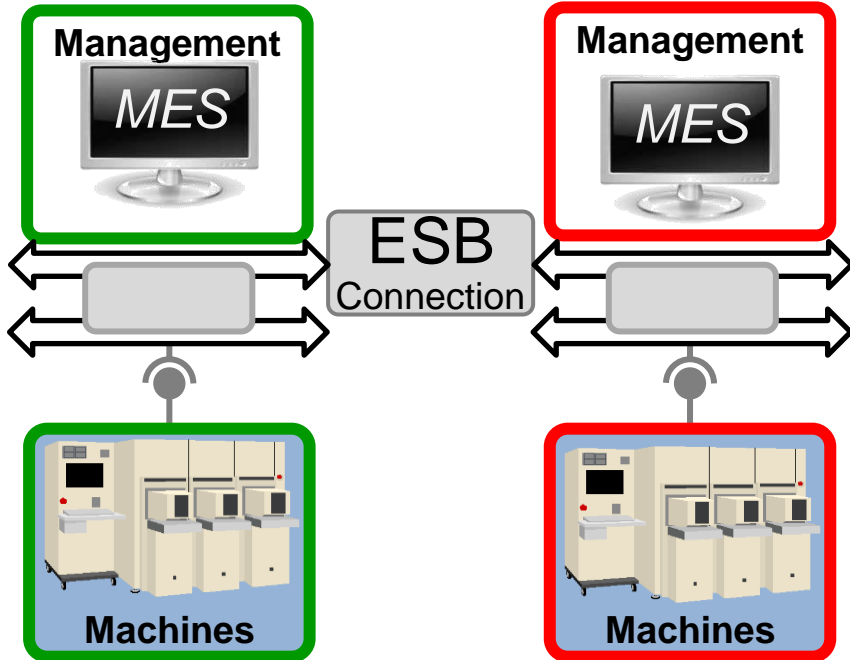


# Result of Collaborative R&D Project – Stating Point

## Conv. Communication Use Case

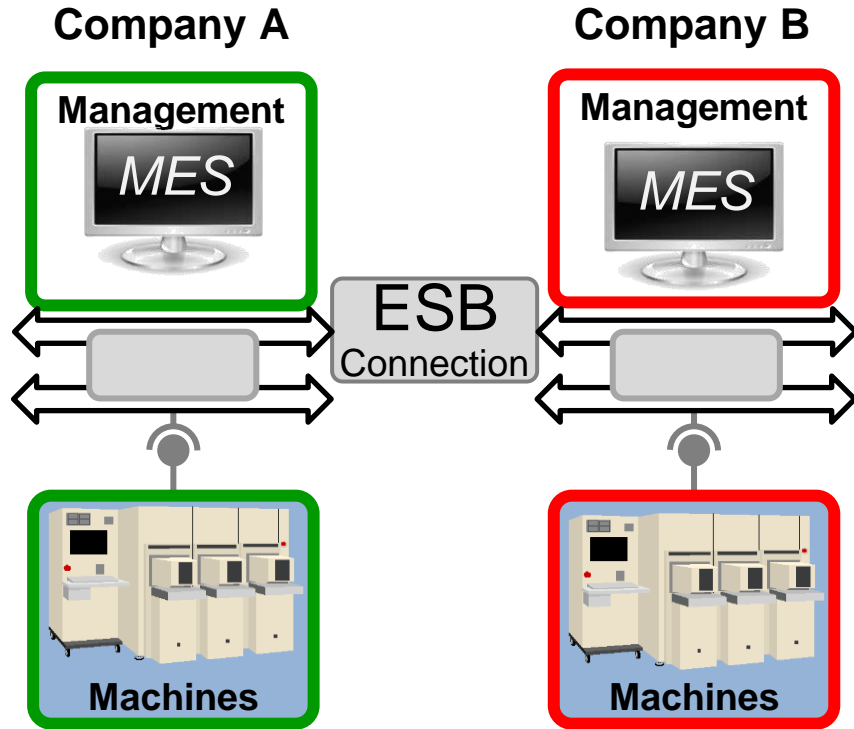
Company A

Company B

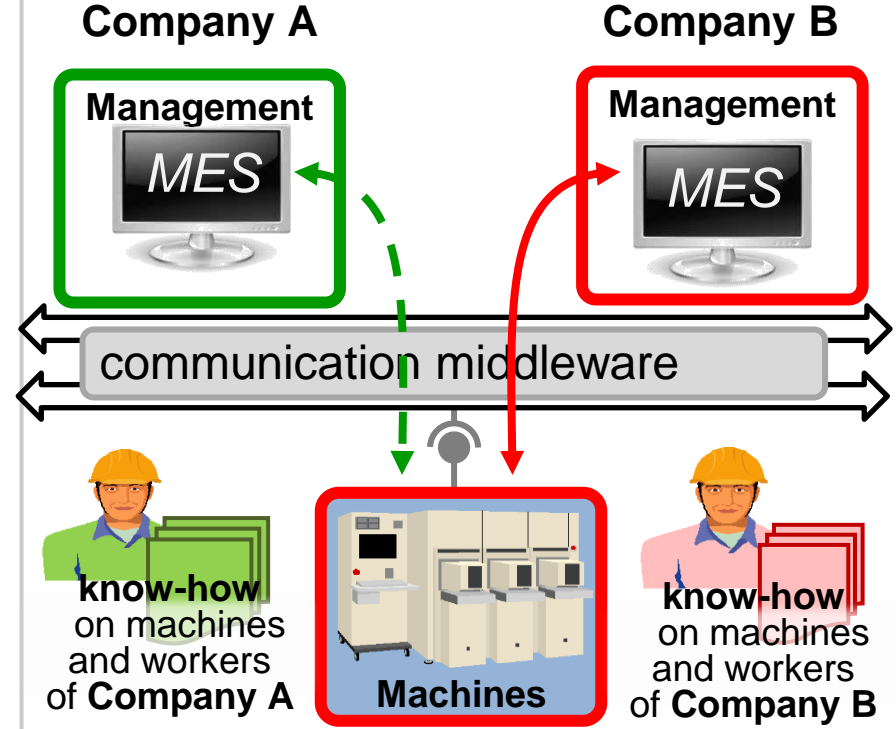


# Result of Collaborative R&D Project – Crowd Manufacturing

## Conv. Communication Use Case



## Crowd Manufacturing Use Case





## Dynamic Virtual Factory

Company A

Management



Dynamic Switching

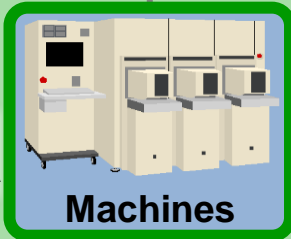
Company B

Management



Dynamic Linkage

know-how  
of Company A



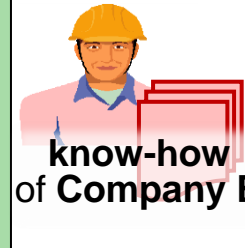
Machines

know-how  
of Company A



Machines

know-how  
of Company B



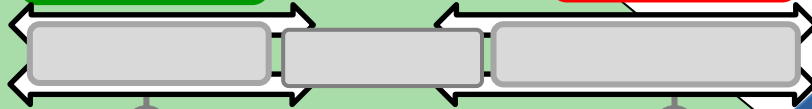
Company A

Managem  
MES

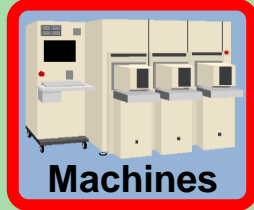


Company B

Managem  
MES



Machines

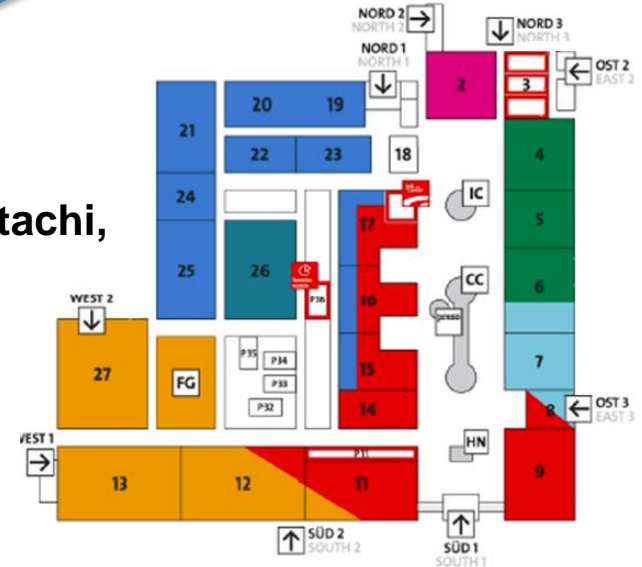


Machines

**Dynamic Virtual Factory**

Continuous optimization of the production system through Dynamic Scheduling

Learn at Hitachi,  
Hall 12



- To establish a symbiotic manufacturing society to exchange production resources and their related information between companies for on-demand production, Hitachi proposed “Crowd manufacturing” concept
- “Crowd manufacturing” was published in IEC Market Strategy Board “Factory of the future” white paper
- Hitachi, the Fraunhofer IPA, and the Hungarian Academy of Science have been collaborating on R&D for Crowd Manufacturing

**HITACHI**  
Inspire the Next 