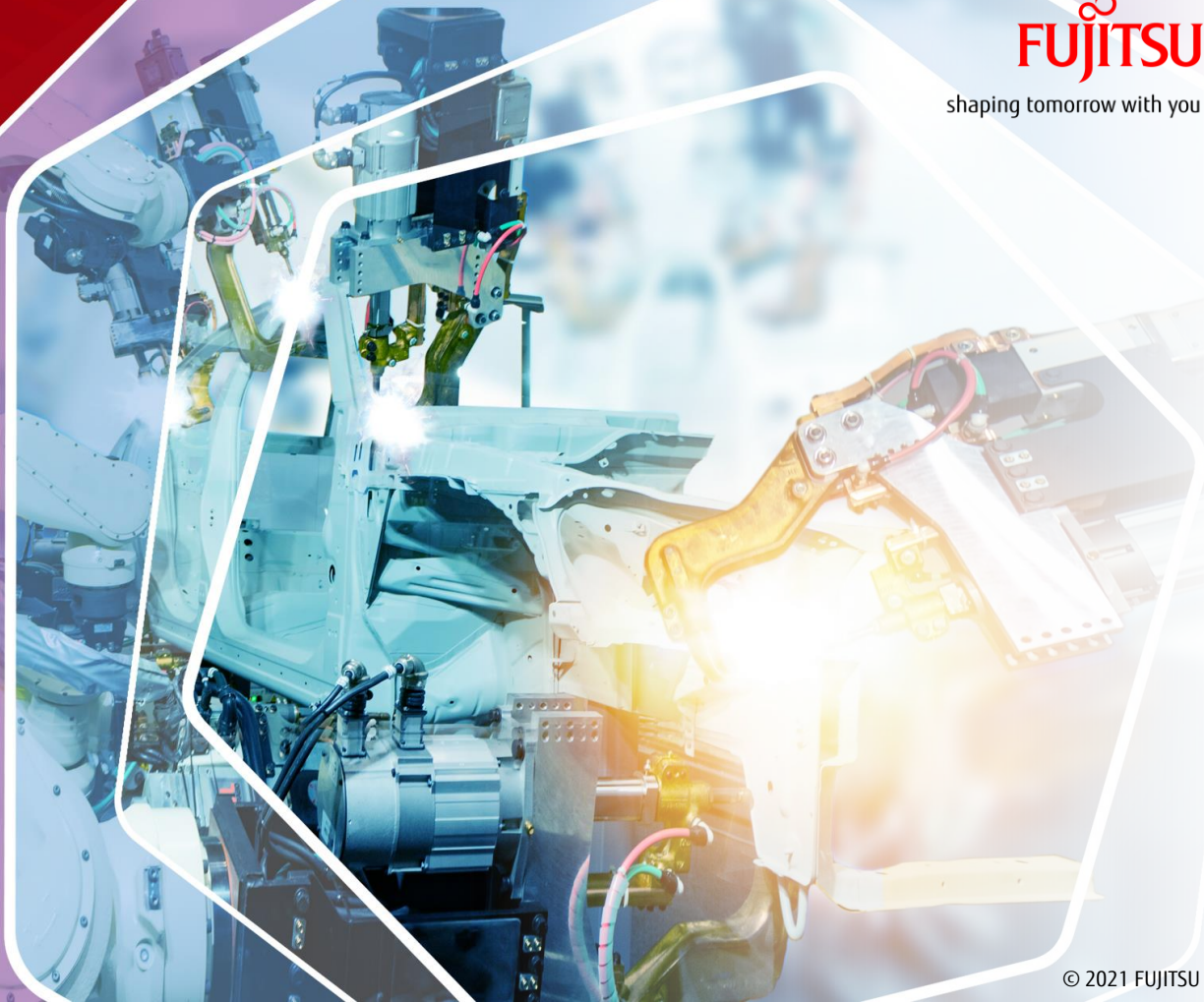


# Think beyond the factory

HANNOVER MESSE digital  
12.-16. April 2021

**FUJITSU**

shaping tomorrow with you

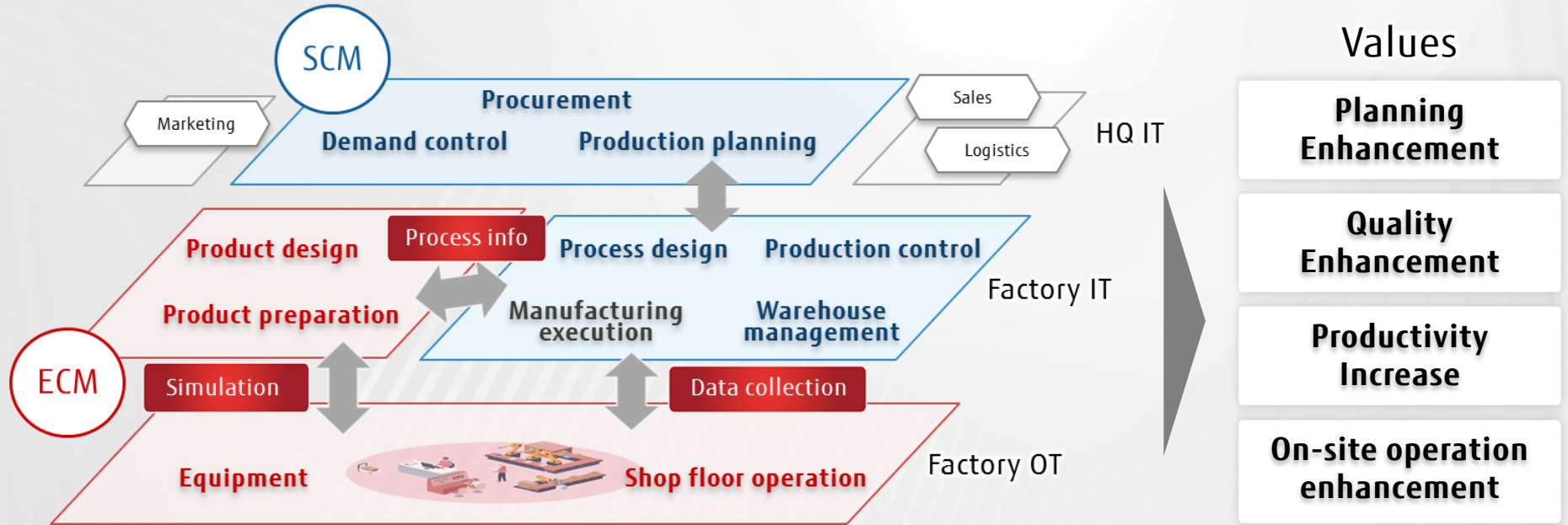


A grayscale image of an industrial robotic arm, likely a welding or assembly robot, positioned in a factory setting. The arm is the central focus, with various mechanical components, cables, and a gripper visible. The background is slightly blurred, showing other parts of the industrial environment.

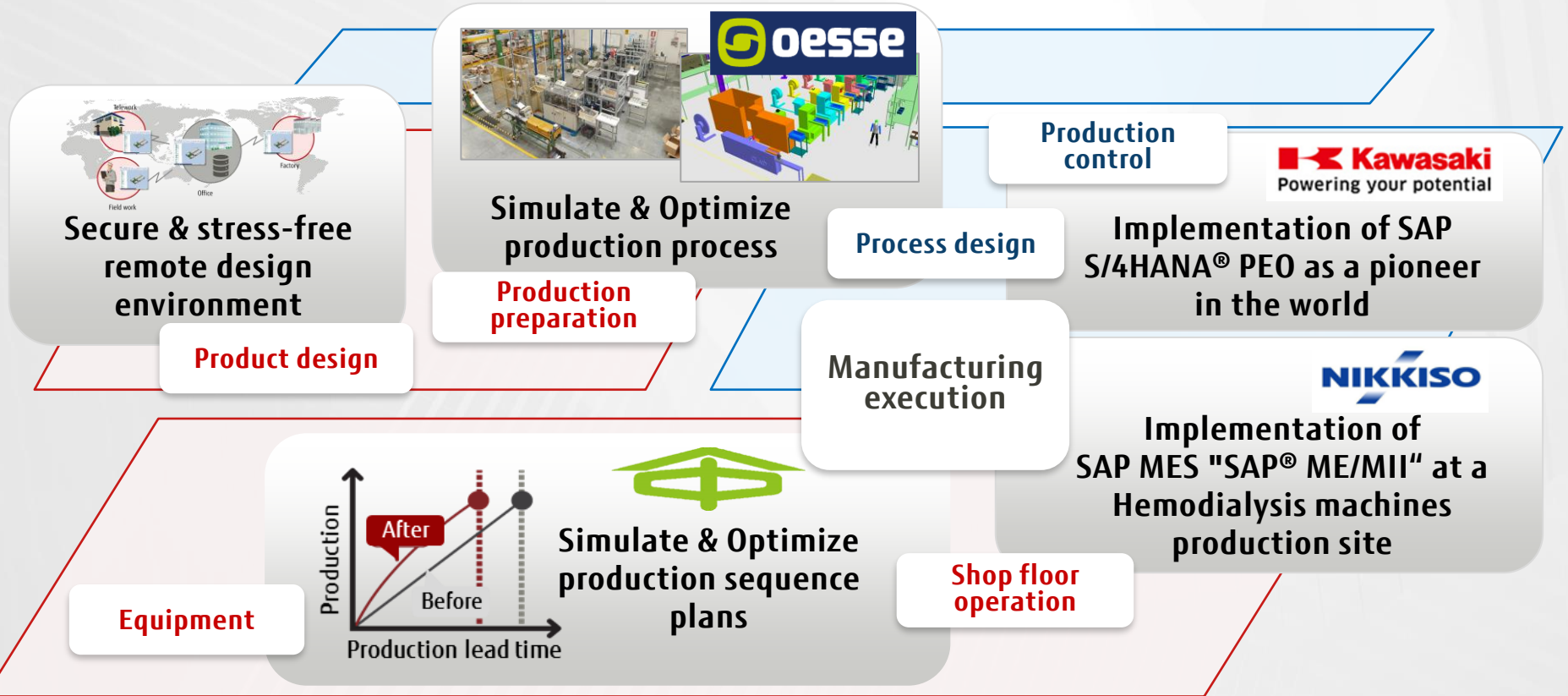
# Smart Manufacturing for building resiliency – COLMINA and SAP customer references

# Coverage of Fujitsu's Smart Manufacturing

- Fujitsu realizes 4 values through the DX of processes in the engineering and supply chain and by connecting the 2 chains



# Customer References – COLMINA & SAP Offerings



# COLMINA Customer References

"Simulate & Optimize Production Sequence Plans"

"Simulate & Optimize Production Process"

"Secure & Stress-free Remote Design Environment"

A grayscale image of an industrial robotic arm, likely a SCARA or similar type, used for manufacturing. The arm is positioned in the center of the frame, with its joints and gripper visible. The background is dark and slightly blurred, emphasizing the mechanical structure of the robot.

COLMINA Sequence Planning Optimization  
Case Study

“Simulate & Optimize Production Sequence Plans”

# Simulate & Optimize Production Sequence Plans

Koide Poland Sp. z o.o. (Automobile metal parts manufacturer)



## ■ Customer Challenge

- Planning takes time due to complex production sequence combinations resulting from production of multiple products with differing process times
- Consideration of trade-offs involving multiple KPIs (production lead time, cost, changeover time, etc.) increases the difficulty of planning

## ■ Approach

- High speed optimization using Fujitsu-developed proprietary technology
- Enabling multi-objective optimization of production KPIs

## Benefits

- 6%-10% reduction in production lead time through the optimized production sequence
- Ability to respond more quickly to unexpected re-planning

# Simulate & Optimize Production Sequence Plans

■ We implemented a Proof of Concept targeting selected lines in the factory

## Modeling

Layout Information



Product Master

Product No.	Cycle time			
	M-1	M-2	M-3	M-4
1	10	20	10	15
2	10	-	9	5
.	.	.	.	.

Production Plan



Product Volume

Product No.	Product Quantity
1	10
2	20
.	.



Input is easy

## Optimization

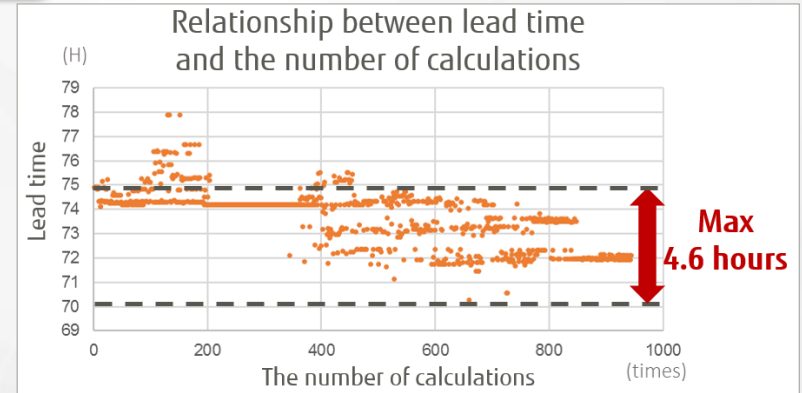
COLMINA SPO



Simulation is fast  
(Only 30 minutes)

## Verification

**1st Step** Optimize production lead times for selected products



**Next Step** Contributing to further improvements in productivity



Expansion of the applicable products and lines



Validate multiple KPIs



A grayscale background image of industrial machinery, likely a robotic assembly line, with various mechanical parts and structures. The image is overlaid with a white, semi-transparent geometric shape that frames the text.

COLMINA Digital Manufacturing FJVPS & FJGP4D  
Case Study  
"Simulate & Optimize Production Process"

# Optimization of production process

OESSE Italy (heat exchanger manufacturer)



## ■ Customer Challenge

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- To provide a highly customized product by specifying points to be improved in production
- In order to increase production, it was necessary to make effective use of production space and processes

## ■ Approach

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- Problems to be improved in the production line were visualized by the Fujitsu production line simulator.
- Estimate the production capacity of a process to achieve maximum performance.

## Benefits

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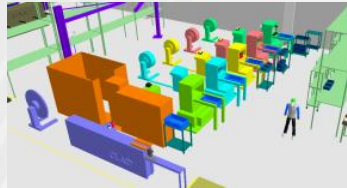
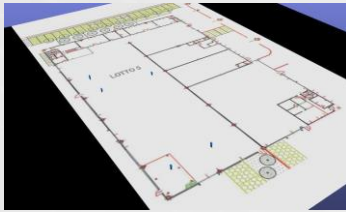
- Cycle time reduction of 13% (from 257 minutes to 226 minutes)
- Improving line balancing and work ergonomics

# Optimization of production process

- Verify and confirm the AS-IS cycle time of the production line

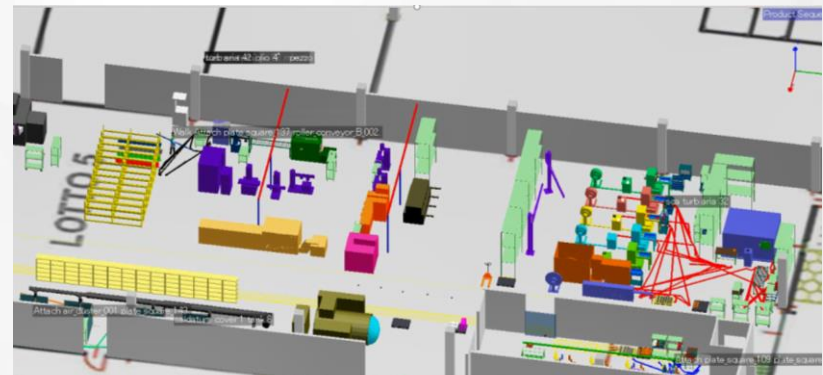
Optimization

## Create 3D production line



Create the current layout of the production process

## Generate simulation data



Affiliation Process	Time (min)			
	Hand	Walk	Wait	Total
Assembly operator	217,9	6,7	0,1	224,7
Machining operator	94,6	7,0	110,5	212,1
Press operator	31,7	14,0	195,3	241,0
SG welding operator	218,1	4,4	18,5	241,0
Tank welding operator	180,6	9,5	65,9	255,9

Find issues on a virtual production line.

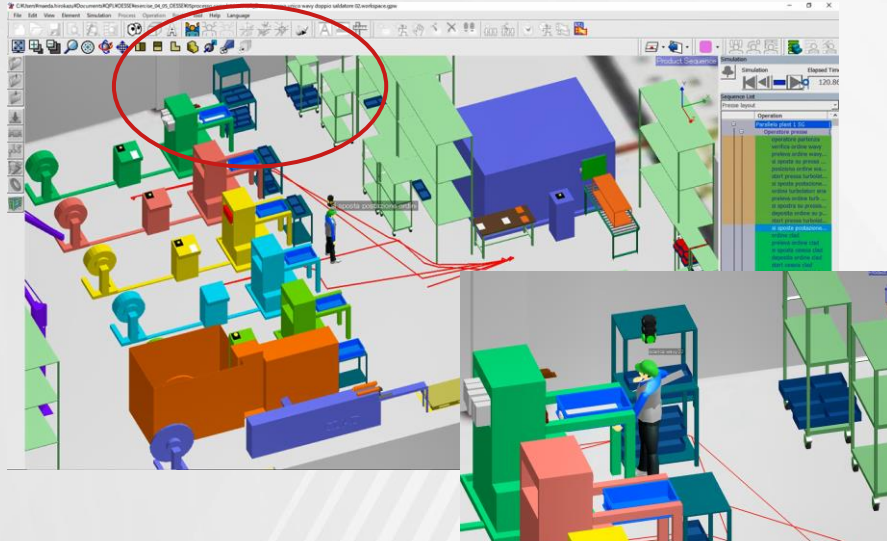
# Optimization of production process

- Verify and confirm the AS-IS cycle time of the production line

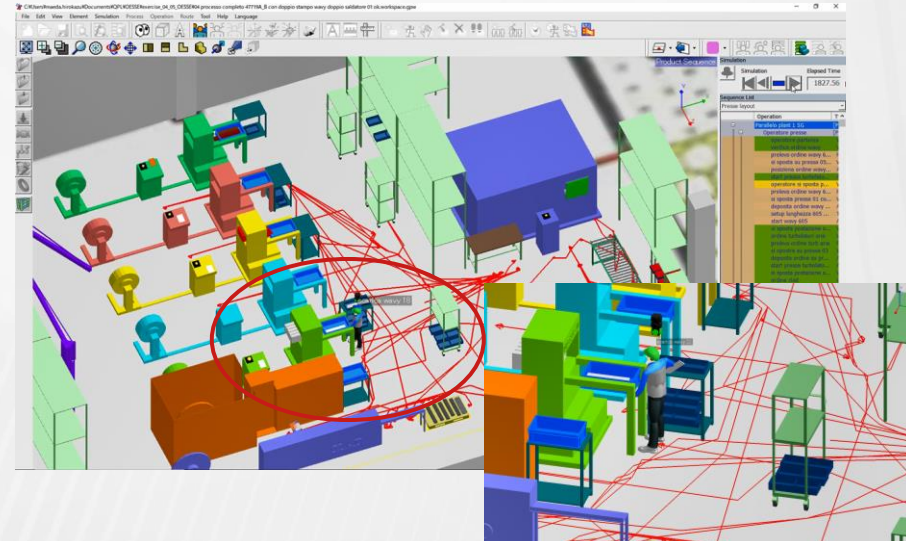
Optimization

Verify and improve the production process

Visualize and compare multiple ideas



KAIZEN STEP 1



KAIZEN STEP 2

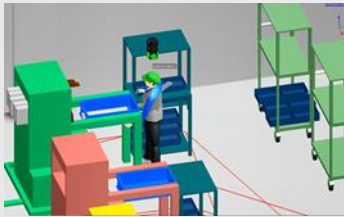
# Optimization of production process

Optimization

- Verify and confirm the AS-IS cycle time of the production line

## Verify and improve the production process

Visualize and compare multiple ideas

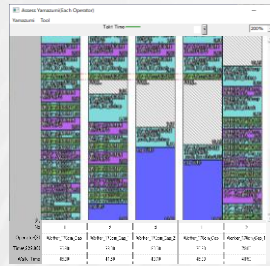


KAIZEN STEP 1

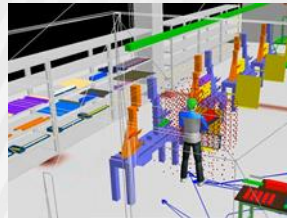


KAIZEN STEP 2

Verify and improve process balance



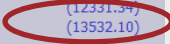
Improve work ergonomics



After KAIZEN

Cycle time reduction of 13%  
(from 257 minutes to 226 minutes)

	Operation	Type	Element	Target	Time[s]	W
-	Parallelo plant 1 SG	[ParalleProcess]			(13532.10)	
+	Operatore presse	[Process]			(2800.24)	
+	Stampaggio wavy 655	[Process]			(10560.00)	
+	stampaggio wavy 605	[Process]			(3780.00)	
+	Stampaggio turb aria	[Process]			(6000.00)	
+	Cesola clad 655_605	[Process]			(551.50)	
+	Stampaggio turb olio	[Process]			(1140.00)	
+	Ciclo lavaggio	[Process]			(3840.00)	
+	taglio space bar	[Process]			(3696.25)	
+	Operatore lav mec.	[Process]			(7478.30)	
+	Operatore assiemaggio	[Process]			(13482.10)	
+	Brasatura	[Process]			(3702.00)	
+	Daewoo	[Process]			(4680.00)	
+	Operatore saldatura tank	[Process]			(12531.34)	
+	Operatore saldatura SG	[Process]			(13532.10)	



-13%

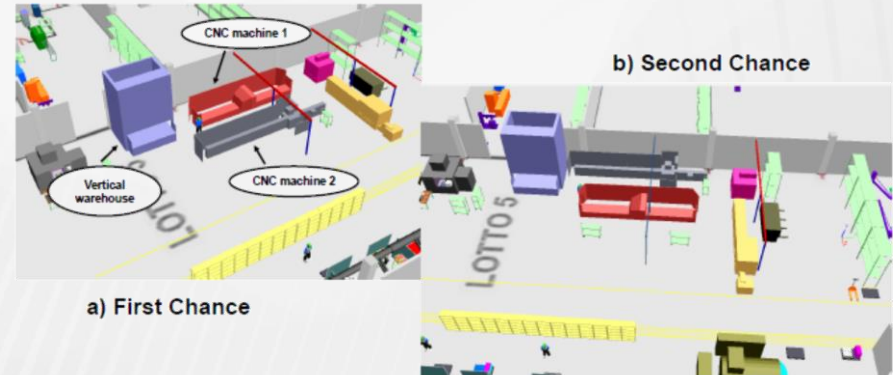
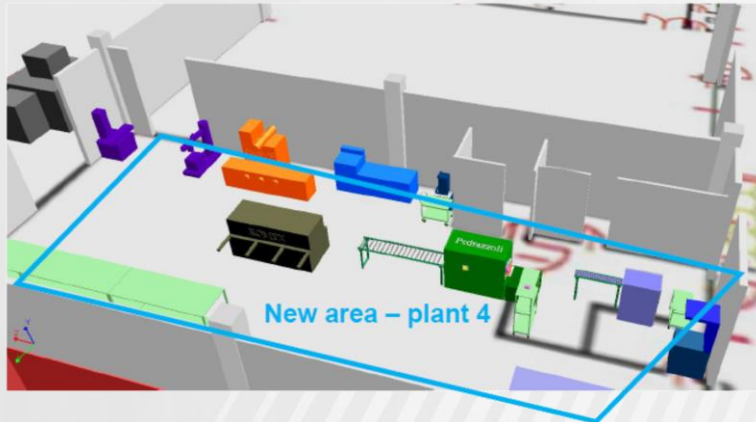
# Optimization of production process

## ■ Future Targets required to analyze by FJGP4D

Create new layout and optimize its process to other area of their shop.

Current CNC machines moved to another place.

Replace new CNC machines included automatic vertical warehouse.



A grayscale background image of industrial machinery, possibly a robotic arm or assembly line, with various components and cables visible. The image is overlaid with a semi-transparent white text box.

COLMINA Design Review High-speed Remote Desktop  
Case Study  
"Secure & Stress-free Remote Design  
Environment"

# Secure & Stress-free Remote Design Environment

Customer: A machinery manufacturer

## ■ Customer Challenge

- Engineering work such as CAD/CAE cannot be done remotely due to screen/operation delay or security issues. Requires Office Visit to Work.
- Time is required for development environment preparation due to external changes

## ■ Approach

- Secure and stress-free remote work environment with Fujitsu's high-speed screen transfer technology
- Design facility consolidation to the data center and cloud for flexible resource sharing

## Benefits

- Increase of operation efficiency and resilience to changes in design work with high-definition CAD/CAE remote environment available anytime and anywhere



## Secure & Stress-free Remote Design Environment

- Effective use of facilities and reduction of management costs with facility consolidation to data center or cloud
- Enables customization of the environment according to external changes in schedules and systems



\* Photography created pre-pandemic 2020

# Product Introduction for COLMINA Customer References



## ■ Simulate & Optimize Production Sequence Plans

- COLMINA Sequence Planning Optimization

<https://www.hannovermesse.de/product/optimize-production-sequence-plans/265721/N1433042>

[https://www.fqs.pl/en/production/products/optimization\\_simulator](https://www.fqs.pl/en/production/products/optimization_simulator)

## ■ Simulate & Optimize Production Process

- COLMINA Digital Manufacturing FJVPS

<https://www.hannovermesse.de/product/assembly-process-design/265720/N1433042>

<https://youtu.be/K5RB8nICE2s>

- COLMINA Digital Manufacturing FJGP4D

<https://www.hannovermesse.de/product/production-line-simulator/265719/N1433042>

[https://youtu.be/g\\_bXVlujN7U](https://youtu.be/g_bXVlujN7U)

## ■ Secure & Stress-free Remote Design Environment

- COLMINA Design Review High Speed Remote Desktop

<https://www.hannovermesse.de/product/secure-remote-design-environment/265722/N1433042>

# SAP Customer References

# Customer References – SAP Offerings



## ■ KAWASAKI

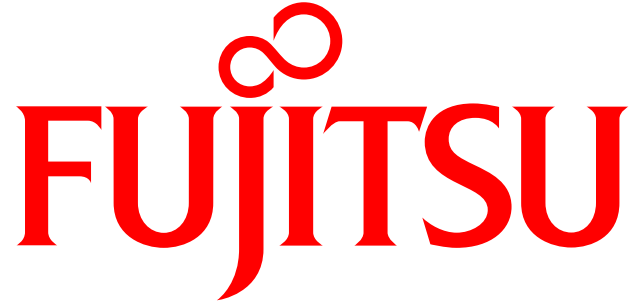
Implementation of SAP S/4HANA® Manufacturing for Production Engineering and Operations as a pioneer in the world

<https://www.fujitsu.com/global/services/application-services/enterprise-applications/industry/references/khi/?from=hannovermesse>

## ■ NIKKISO

Implementation of SAP® Manufacturing Execution and SAP® Manufacturing Integration and Intelligence at a Hemodialysis machines production site

<https://www.fujitsu.com/global/services/application-services/enterprise-applications/industry/references/nikkiso/?from=hannovermesse>



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