SIEMENS
Ingenuity for life

Where smart manufacturing meets tomorrow

Zvi Feuer,

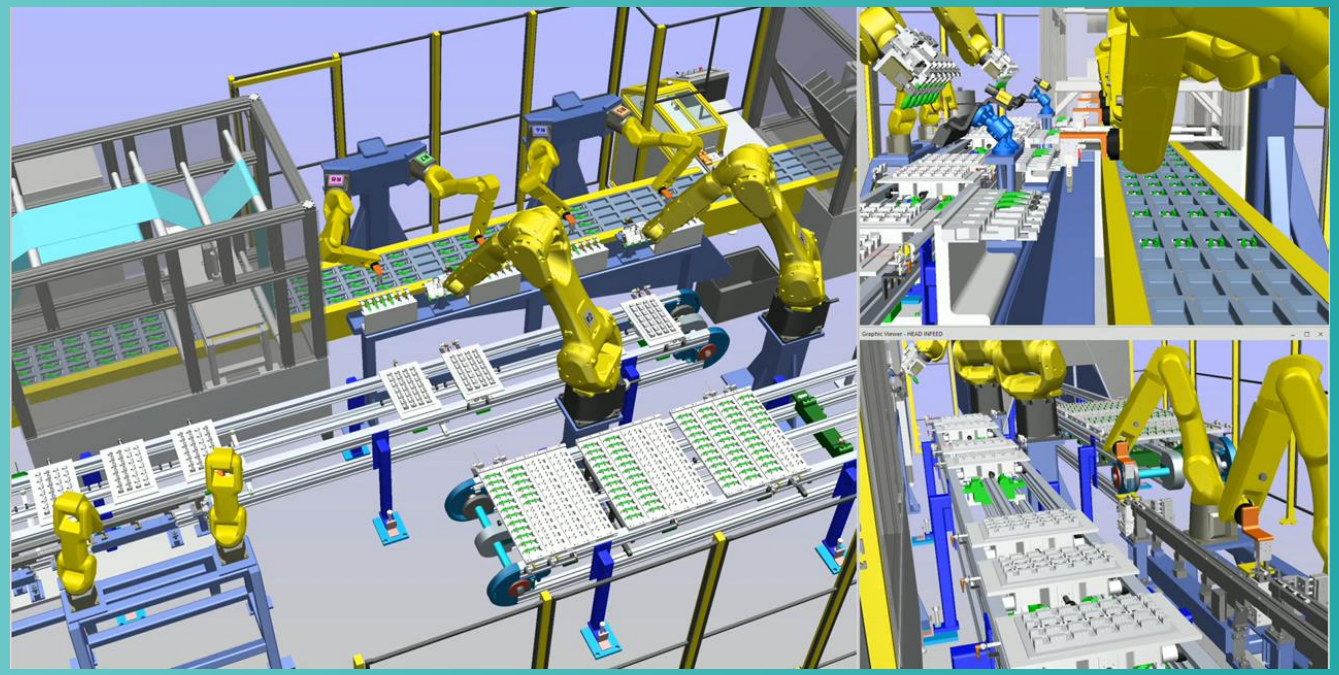
#SiemensNYMAC

SIEMENS
Ingenuity for life

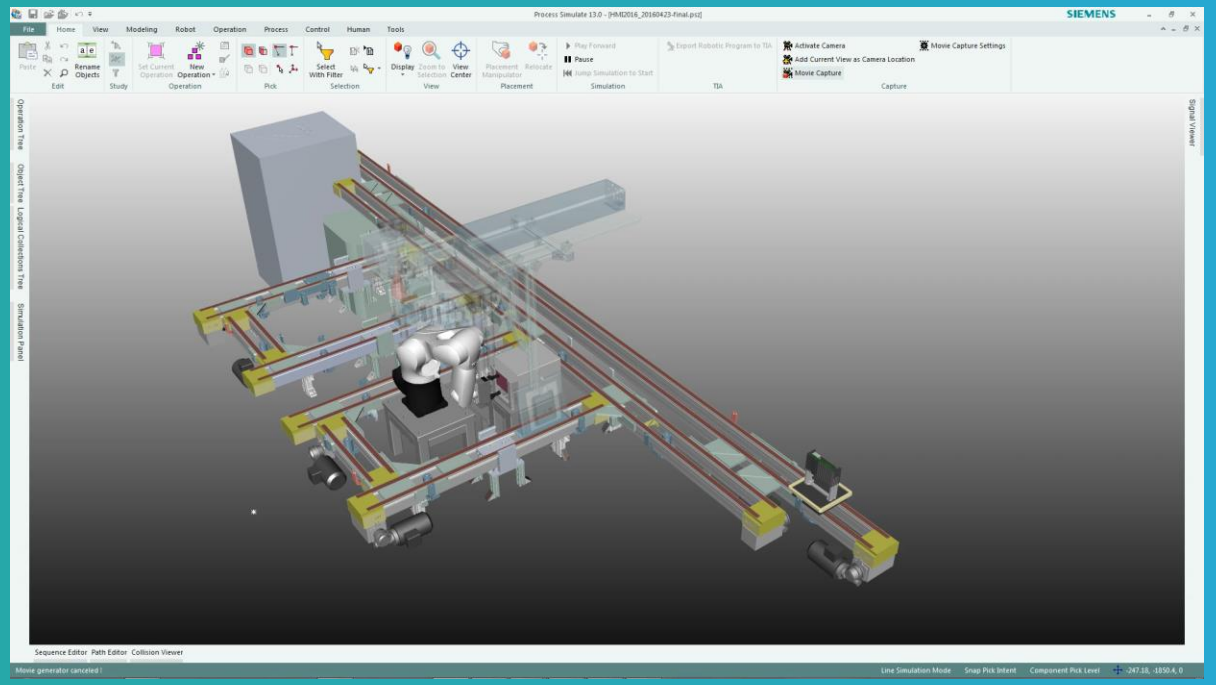
I would like to start with a personal story about Crystal Industries

Digitalization is Everywhere

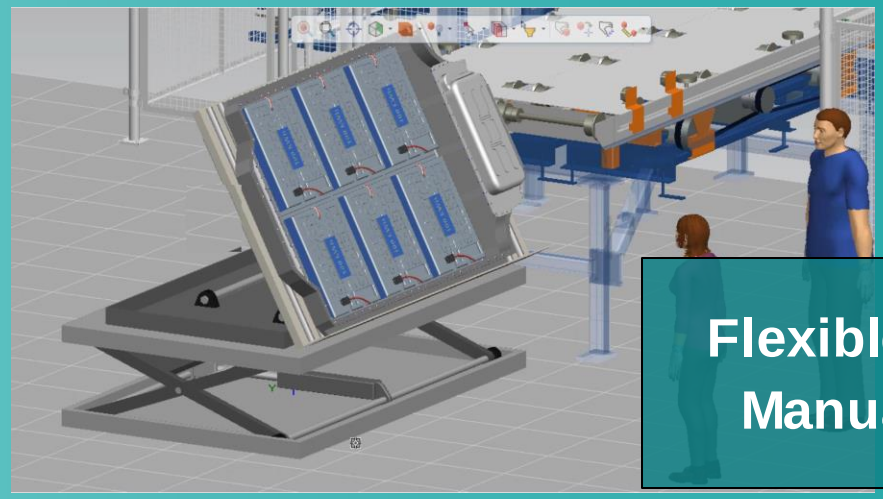
Small Supplier in Canada



In Siemens

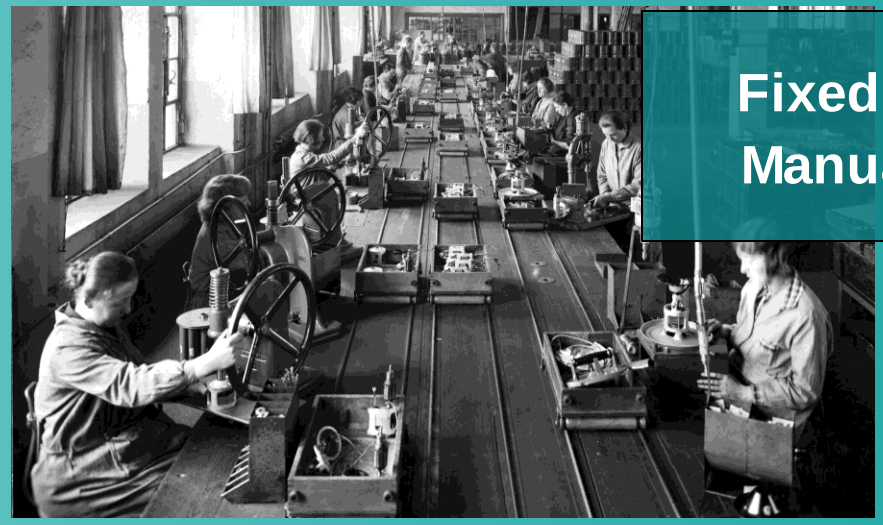


The way forward – Smart, Re-configurable Manufacturing

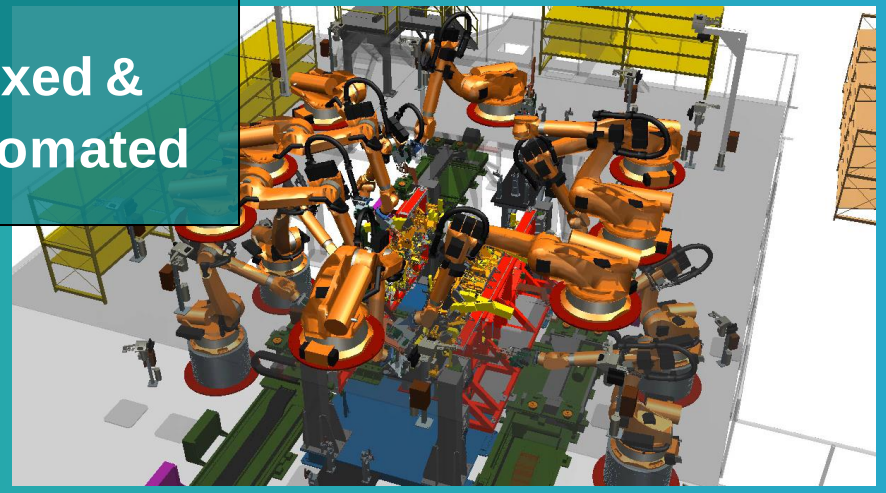


Flexible & Manual

Flexible & Autonomous



Fixed & Manual



Fixed & Automated

Flexibility

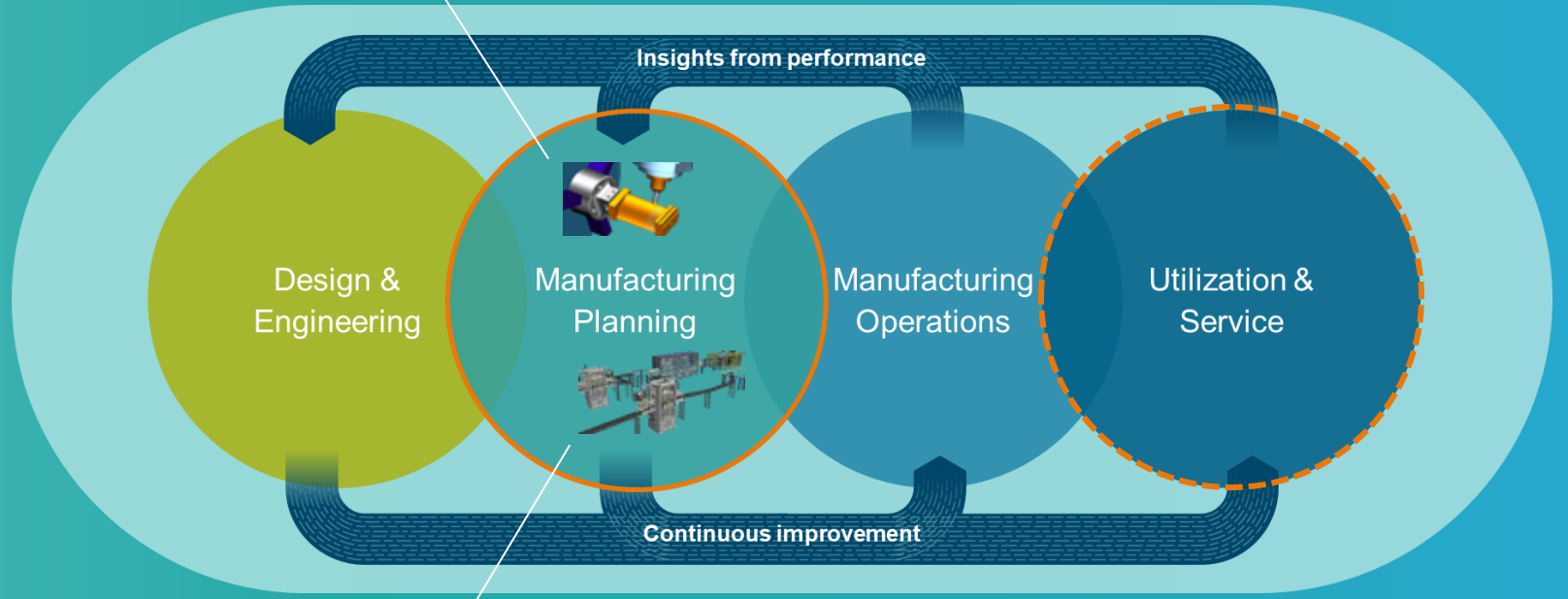
Automation, Autonomy

Competitive advantage

Comprehensive Digital Twin

SIEMENS
Ingenuity for life

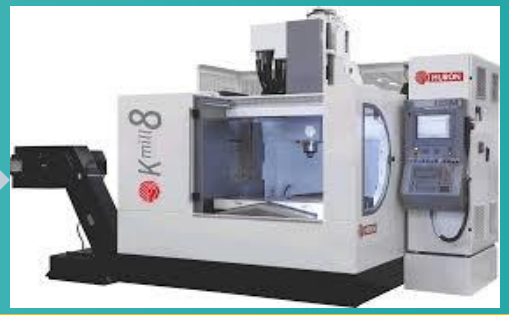
Digital Twin of Manufacturing Process

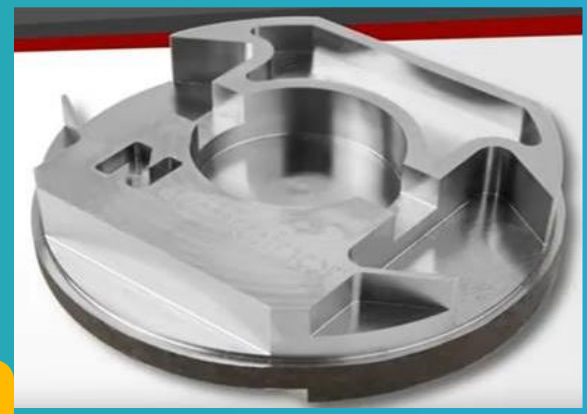


Digital Twin of Production System

The Digital Twin

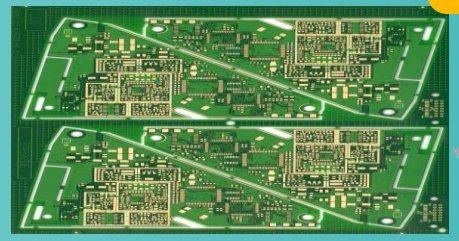
The Digital Twin of Manufacturing Process is critical to transform innovative ideas and raw materials to real products





Developing the BOP

Production Planning & Engineering



Ural
Locomotives
Иваново
ЭС2ГП
001

SOLUTION

NX + Simcenter + Teamcenter

Ural Locomotives relies on Siemens' integrated solution to concurrently engineer and adaptively machine complex lightweight components.

40% SHORTENED NC PROGRAMMING

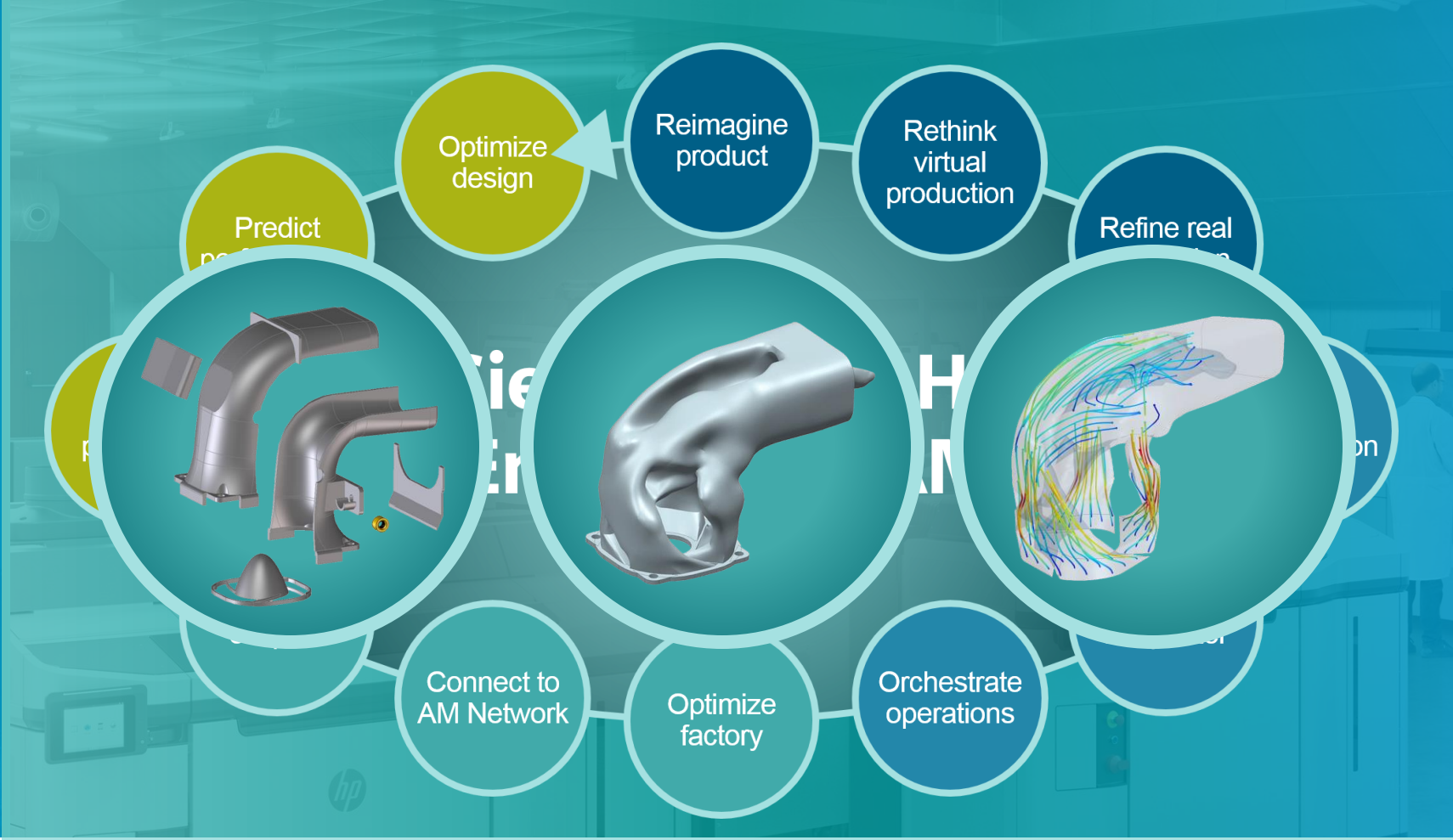
REDUCED MACHINE SETUP TIME

30% REDUCTION OF MACHINING TIME

Solution

Integration

Leverage the entire digital thread for AM design, simulation, 3D printing and performance analytics.



Results:

Amazing

34.3%
Part cost reduction

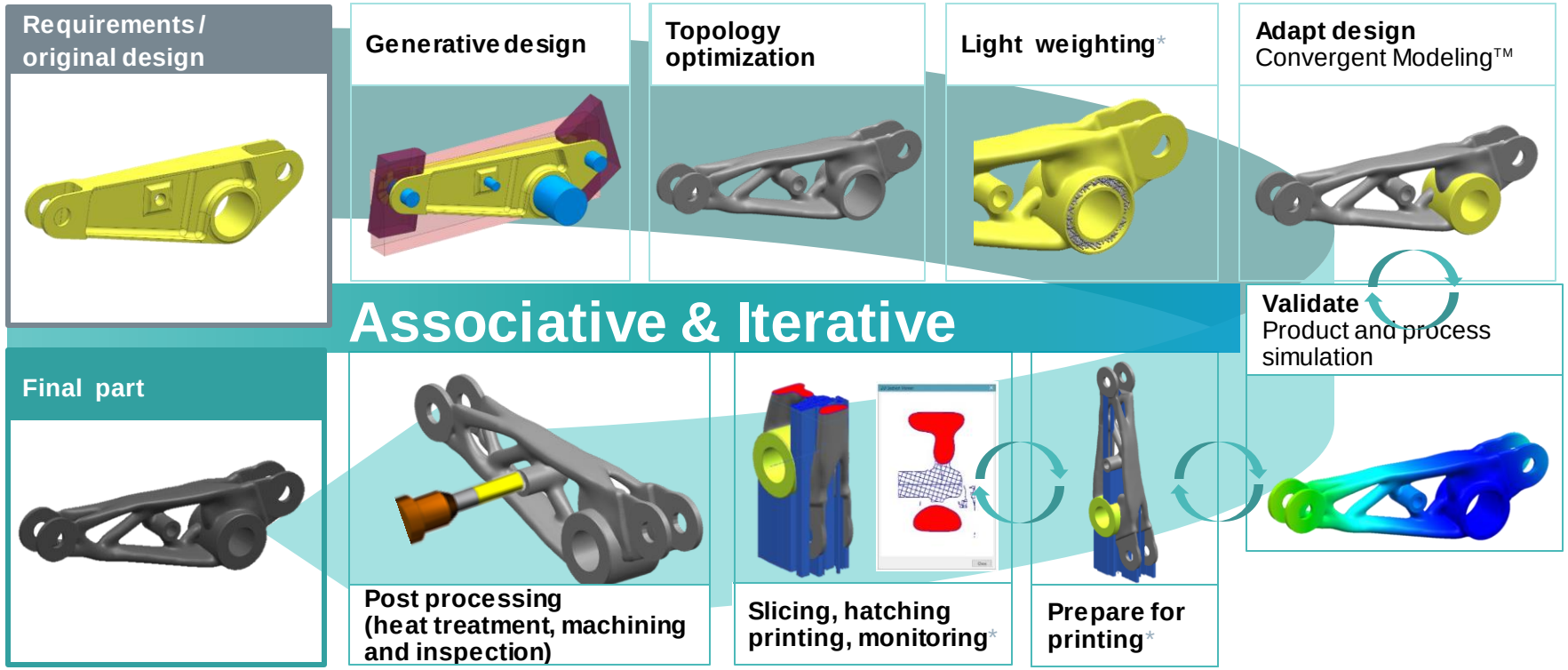
75%
Faster Development

22.3%
Flow control improvement

Unrestricted © Siemens 2020

The Siemens AM offering: Reimagining Design, Production and service with an E2E Additive Manufacturing technology chain

SIEMENS
Ingenuity for life



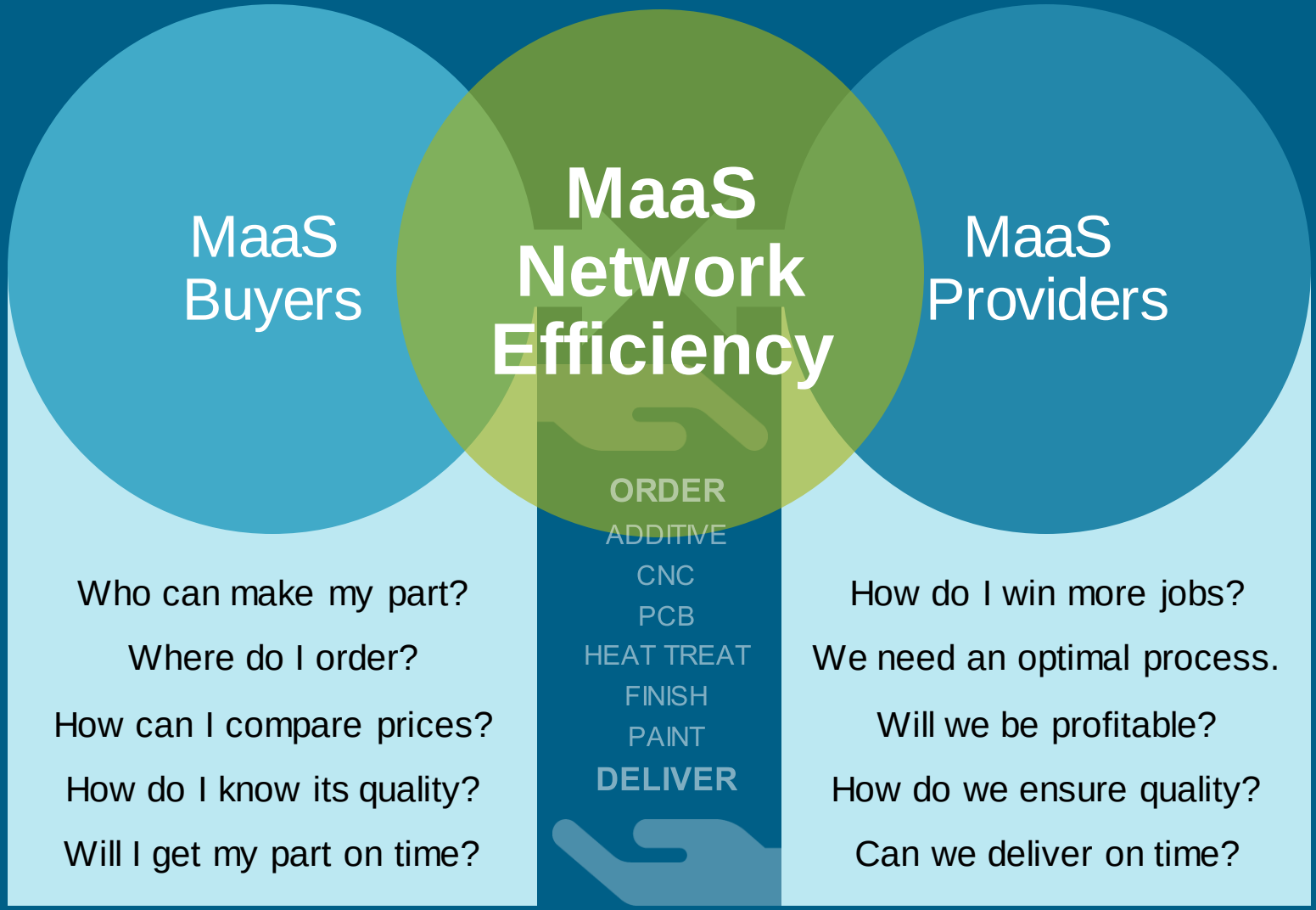
* Powered by Materialise

Unrestricted © Siemens 2019

IMPLICATION

Part buyers and suppliers need a service that efficiently addresses both their requirements.

Manufacturing as a Service Challenge



My Workspace

Show only my orders

New Order

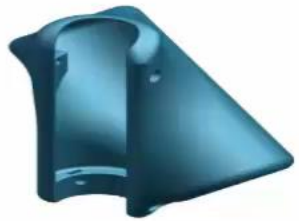
DRAFTS

2 Parts

Last Updated: 17 Nov, 2019 yahel.aricha@siemens.com

Demo_insole_reoriented

Order 3965



1 Part

Last Updated: 10 Nov, 2019 yahel.aricha@siemens.com

99001296446_-_usb_doppelgehaeus

Order 3511

RFQS

2 Parts

Last Updated: 11 Nov, 2019 yahel.aricha@siemens.com

2 Parts

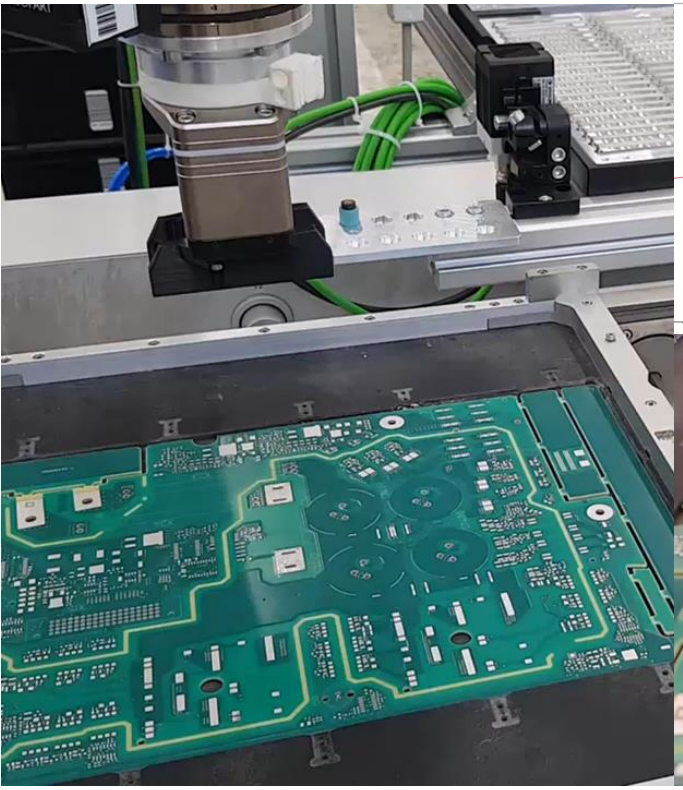
Last Updated: 8 Nov, 2019 yahel.aricha@siemens.com

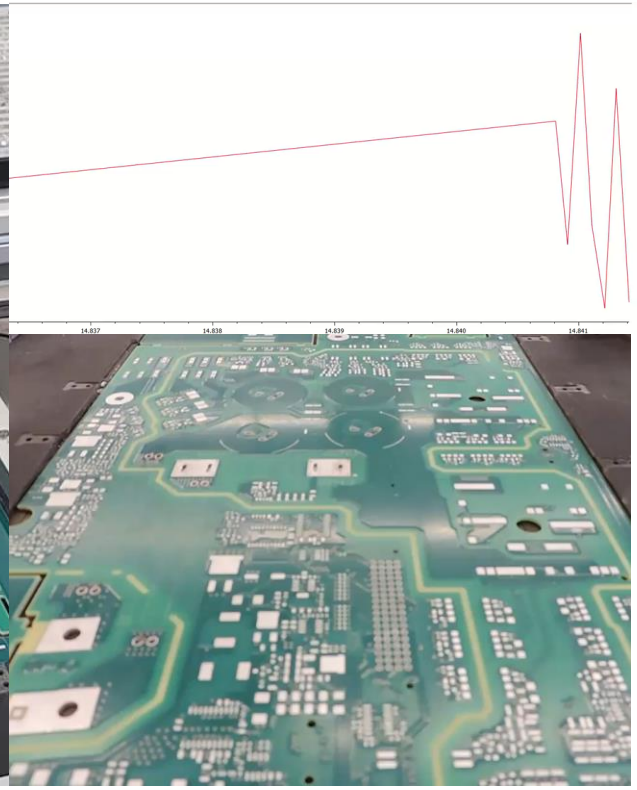
1 Part

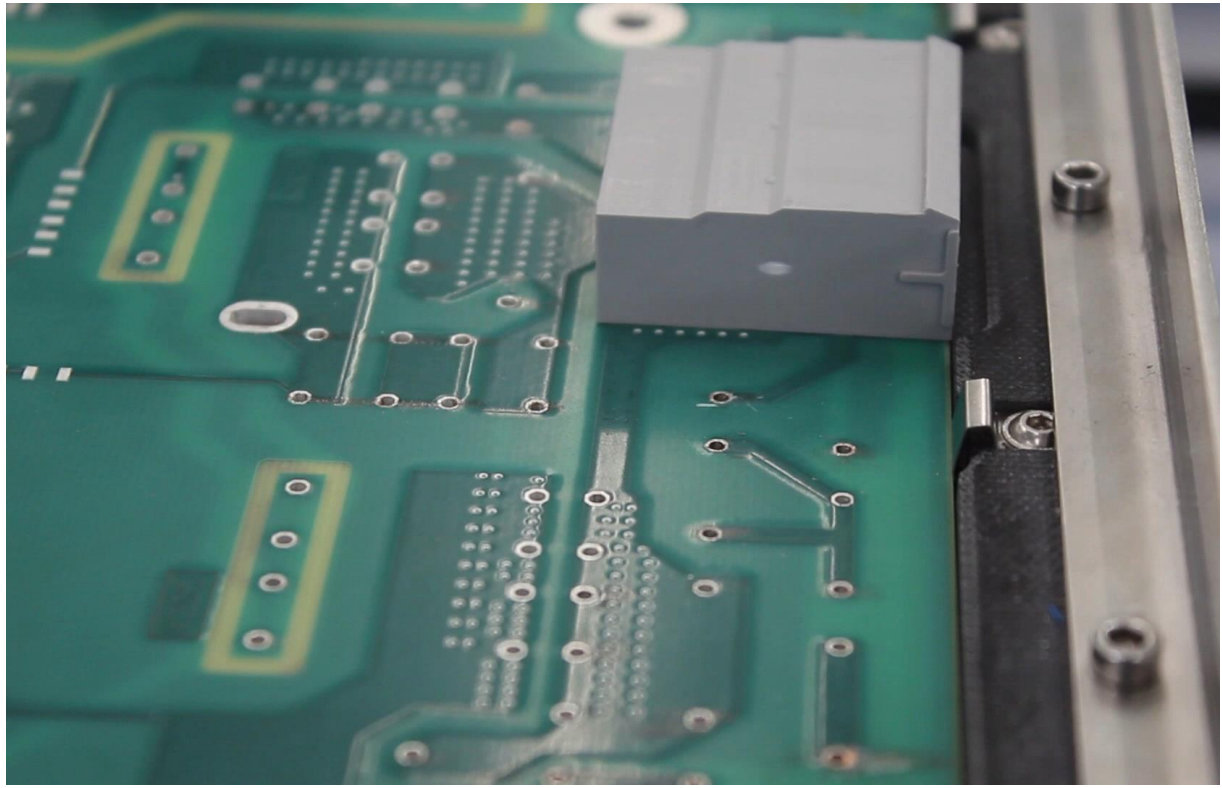
Last Updated: 5 Nov, 2019 yahel.aricha@siemens.com

Smart Assembly using Sensors, Cameras and AI

SIEMENS
Ingenuity for life







ARTIMINDS

Unrestricted © Siemens 2019

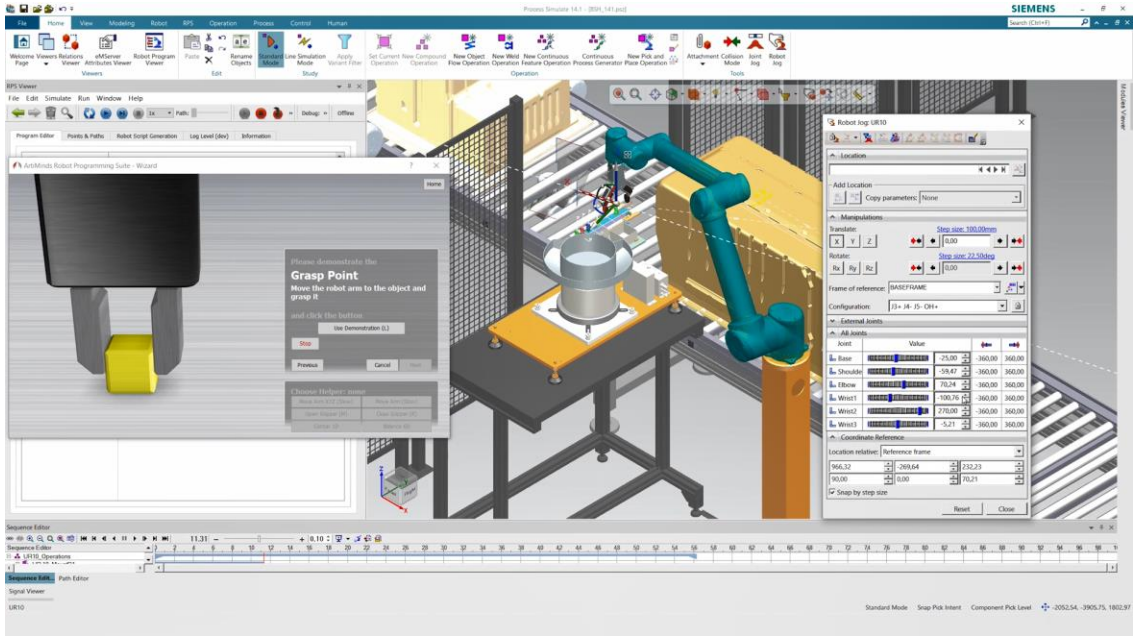
Smart Assembly using Sensors, Cameras and AI

SIEMENS
Ingenuity for life

ARTIMINDS

Task-based programming assembly robotics to replace manual labor for complex assembly

Digital Twin



Physical Implementation

Mounting of reinforcements bushings in refrigerator assembly line in BSH Esquiroz Plant

B/S/H/

Unrestricted © Siemens 2019

Digital Twin of Production System

Complexity & Scale

Developing the BOE

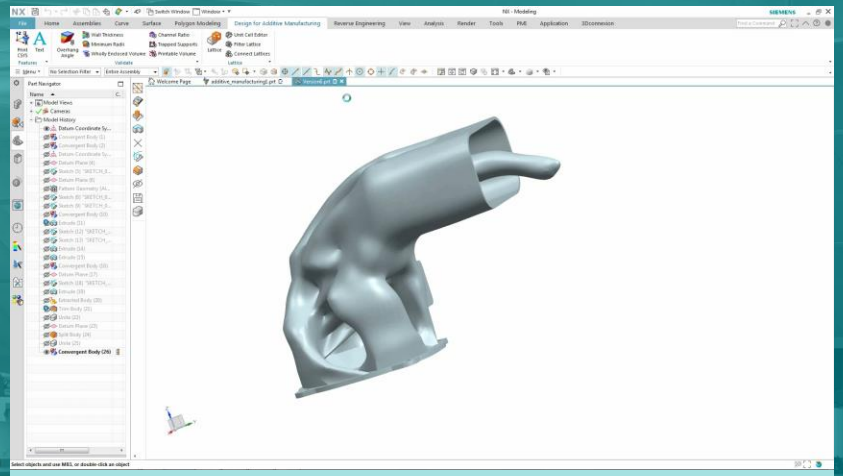
SOLUTION

Integrated AM solution to validate part printability, nest in build tray, optimize print process and orchestrate printing.

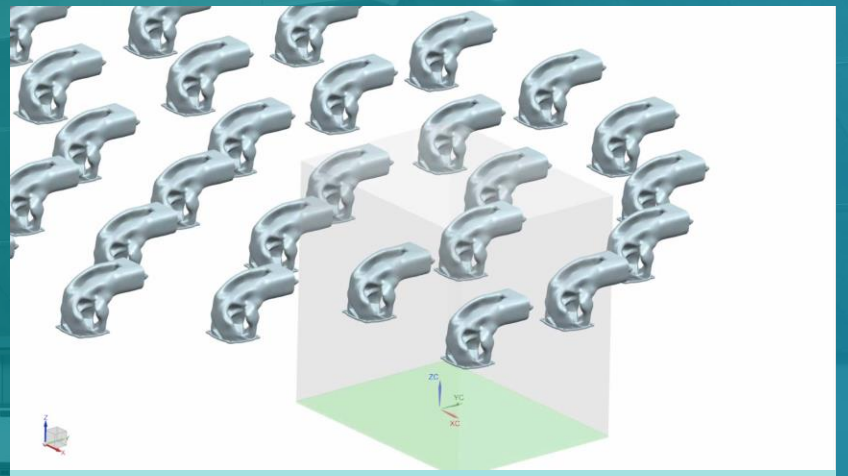
300k DUCTS COULD BE MADE PER YEAR

36/12 WITH 36 HP 5200s AND 12 WORKERS

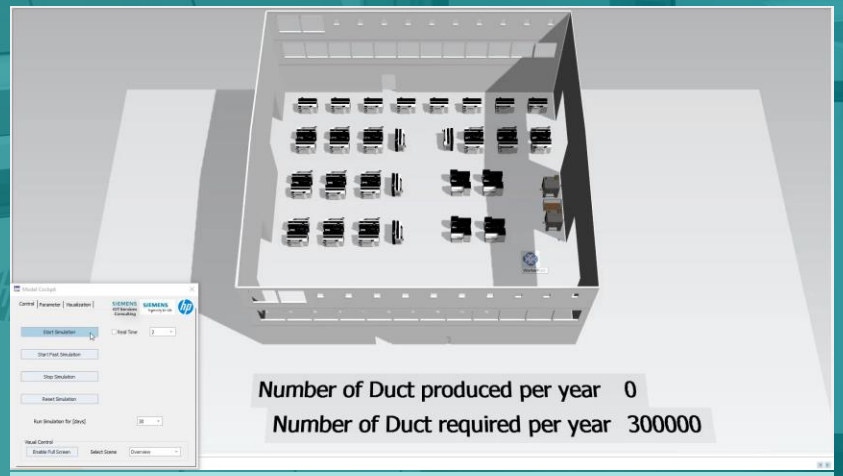
17/auto 17 PRINTERS AND FULL AUTOMATION



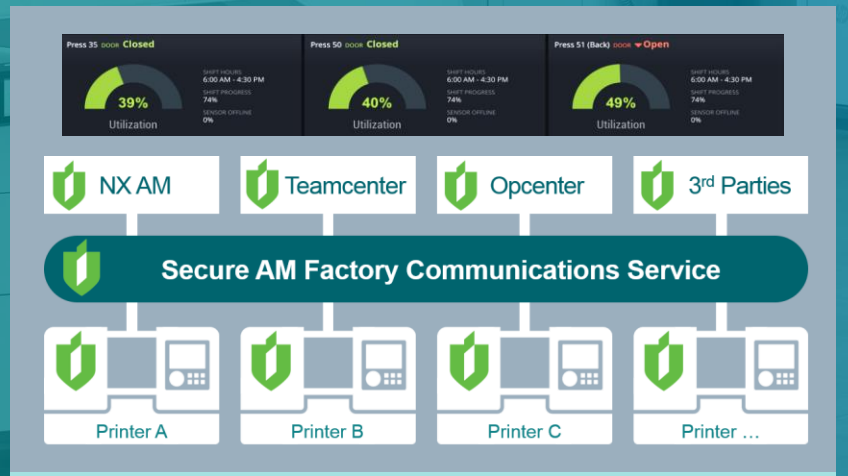
Validate Printability



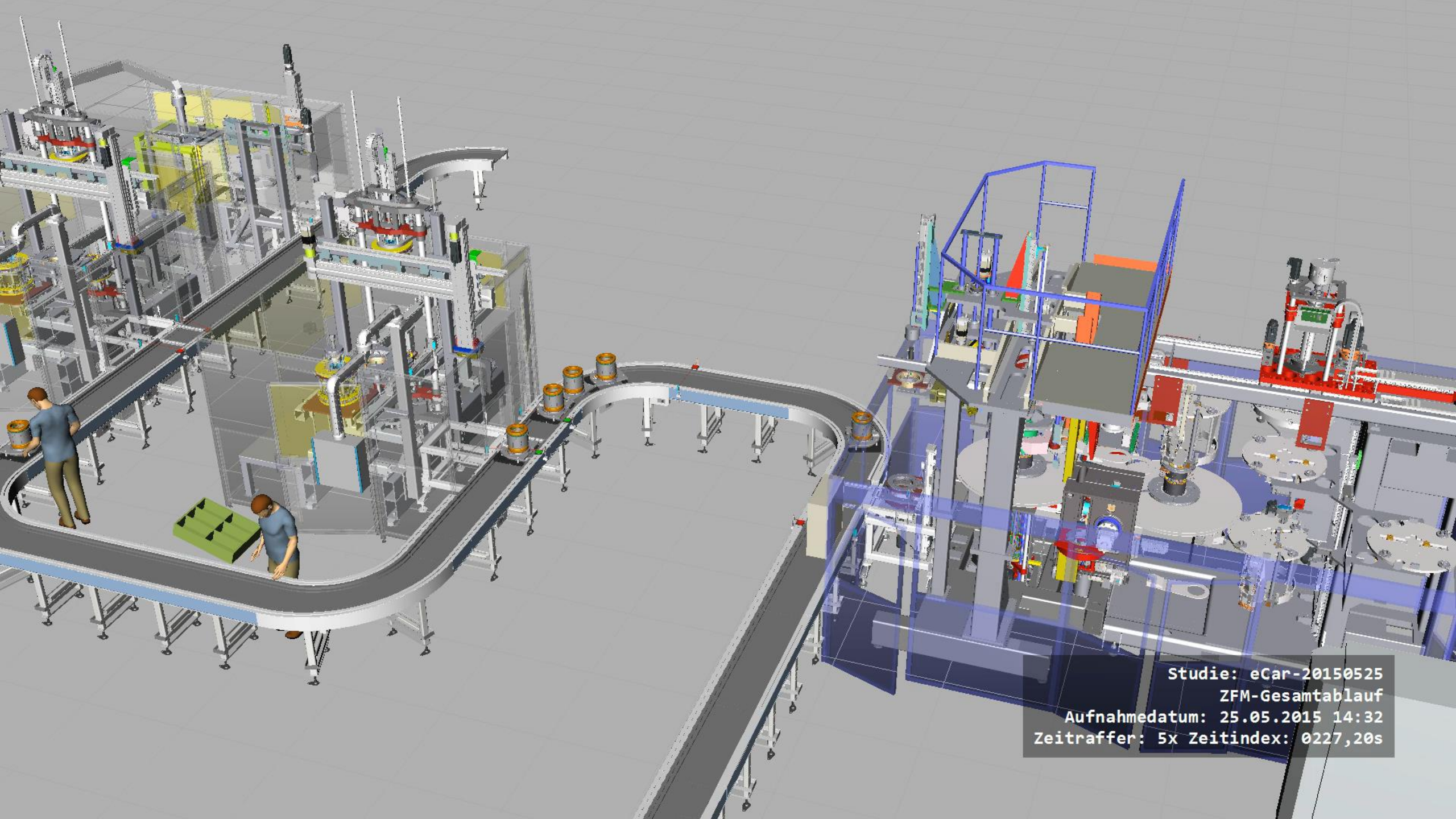
Prepare to 3D Print



Optimize AM Factory



Connect to the Shopfloor


Studie: eCar-20150525
ZFM-Gesamtablauf
Aufnahmedatum: 25.05.2015 14:32
Zeitraffer: 5x Zeitindex: 0227,20s

Digital Twin of an AM factory

Frei verwendbar © Siemens 2019

SOLUTIONS

NX AM, Star CCM+

Process Simulate

Plant Simulation

SELLING POINTS

Integrated solutions to enable the realization new product designs

Proven simulation solutions to increase confidence to produce in high volume

Smart product design

High volume production

Process reliability

Campaign SLT 900.045
GBL Electric Vehicle Manufacturing AT

SIEMENS
Ingenuity for life

YOUR GLOBAL **MOBILITY**
ENGINEERING EXPERTS

MODULAR AND SCALABLE BATTERY HOUSING

SCALEBAT

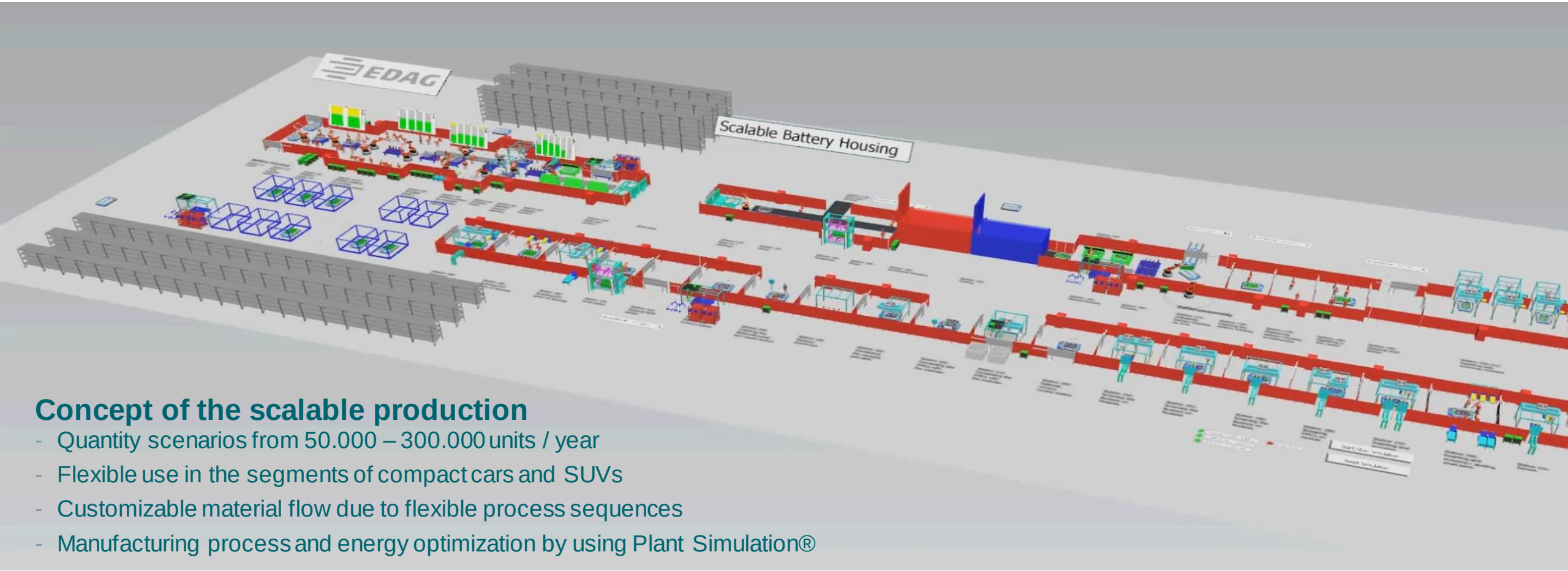
EDAG EDAG EDAG BFFT BAOMARC CLOOS SIEMENS

EDAG

High Volume Production

SCALEBAT – Modern Production Concept

SIEMENS
Ingenuity for life



Concept of the scalable production

- Quantity scenarios from 50.000 – 300.000 units / year
- Flexible use in the segments of compact cars and SUVs
- Customizable material flow due to flexible process sequences
- Manufacturing process and energy optimization by using Plant Simulation®

EDAG EDAG PRODUCTION SOLUTIONS EDAG BFFT ELECTRONICS BAOMARC BAOMARC AUTOMOTIVE SOLUTIONS S.p.A. CLOOS SIEMENS

Restricted © Siemens 2019

Digitalization of Brown Field factories+
Data Collection, Analyses for WW Collaboration

SIEMENS
Ingenuity for life

Guiding Principles:

- Step by Step Implementation
- Achieve value per each step
- Realize value across all sites

Step-7: Operation Planning

Step-6: Process & Simulation

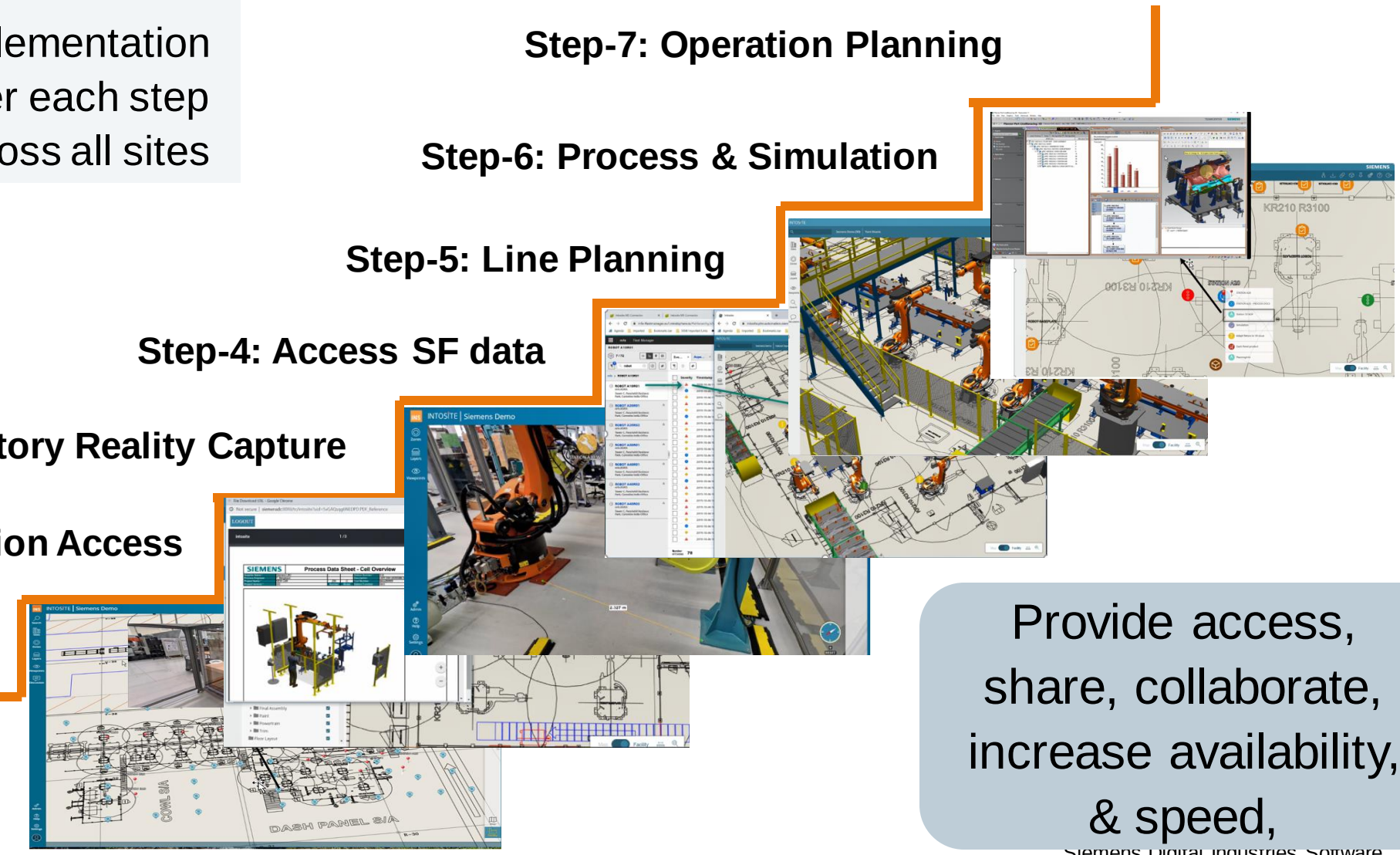
Step-5: Line Planning

Step-4: Access SF data

Step-3: Factory Reality Capture

Step-2: Visual Information Access

Step-1: Factory Visualization



Provide access, share, collaborate, increase availability, & speed,

Data is the most valuable resource

SIEMENS
Ingenuity for life

"..With *97 percent of businesses using data to power their business opportunities and 76 percent of businesses using data as an integral part of forming a business strategy*, what does this mean for your business?"

Leaders
May 6th 2017 edition ›

Regulating the internet giants

The world's most valuable resource is no longer oil, but data

The Economist

Big data analytics examines large amounts of data to uncover hidden patterns, correlations and other insights. With today's technology, it's possible to analyze any data and get answers from it almost immediately

Unrestricted © Siemens 2019

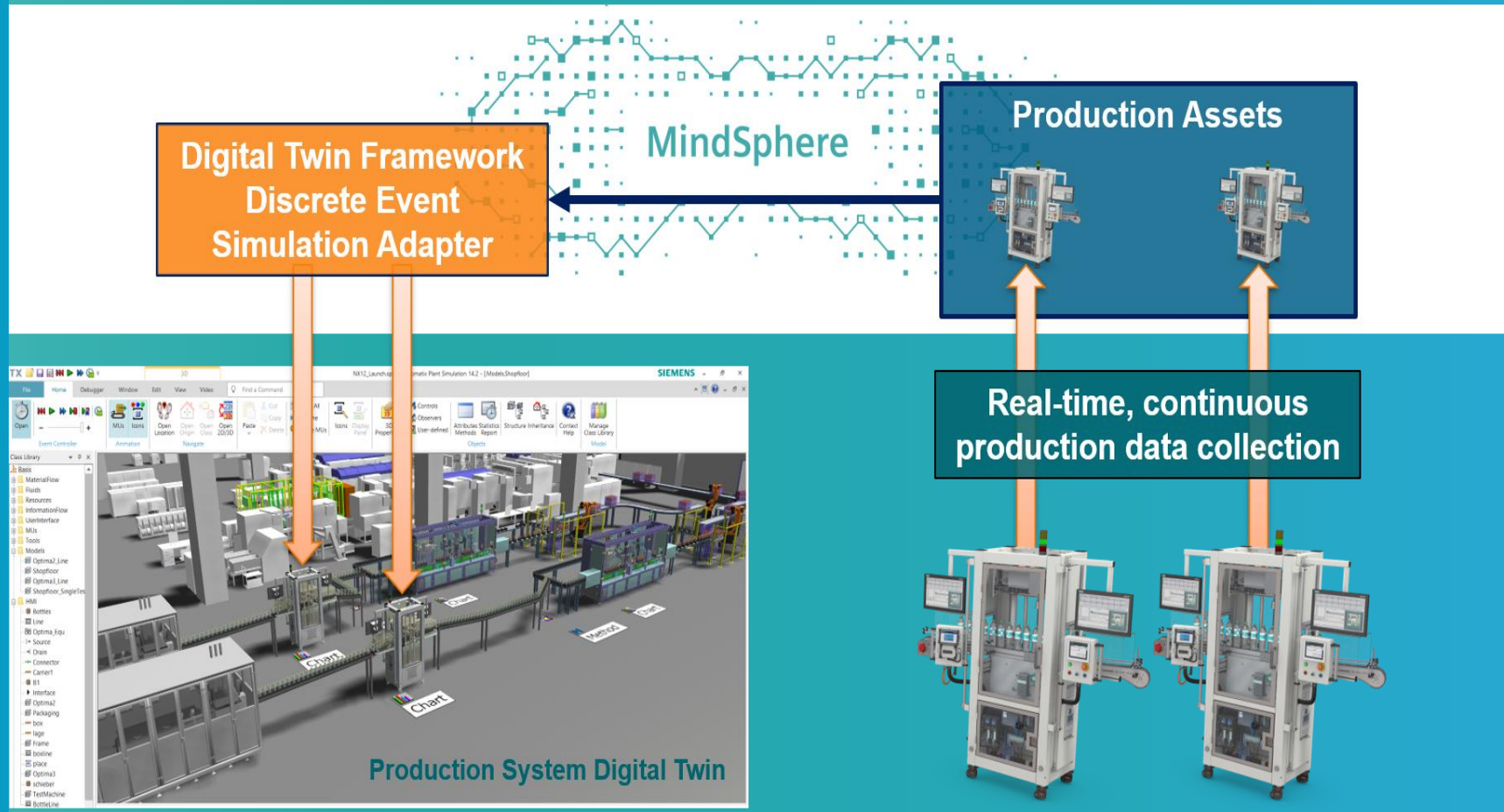
CHALLENGE

Achieve data-driven accuracy to more easily identify and solve production issues.

SOLUTION

Tecnomatix Plant Simulation + MindSphere

Deploy an integrated, solution for real-time collaboration using collected IIoT data and the closed loop Digital Twin.



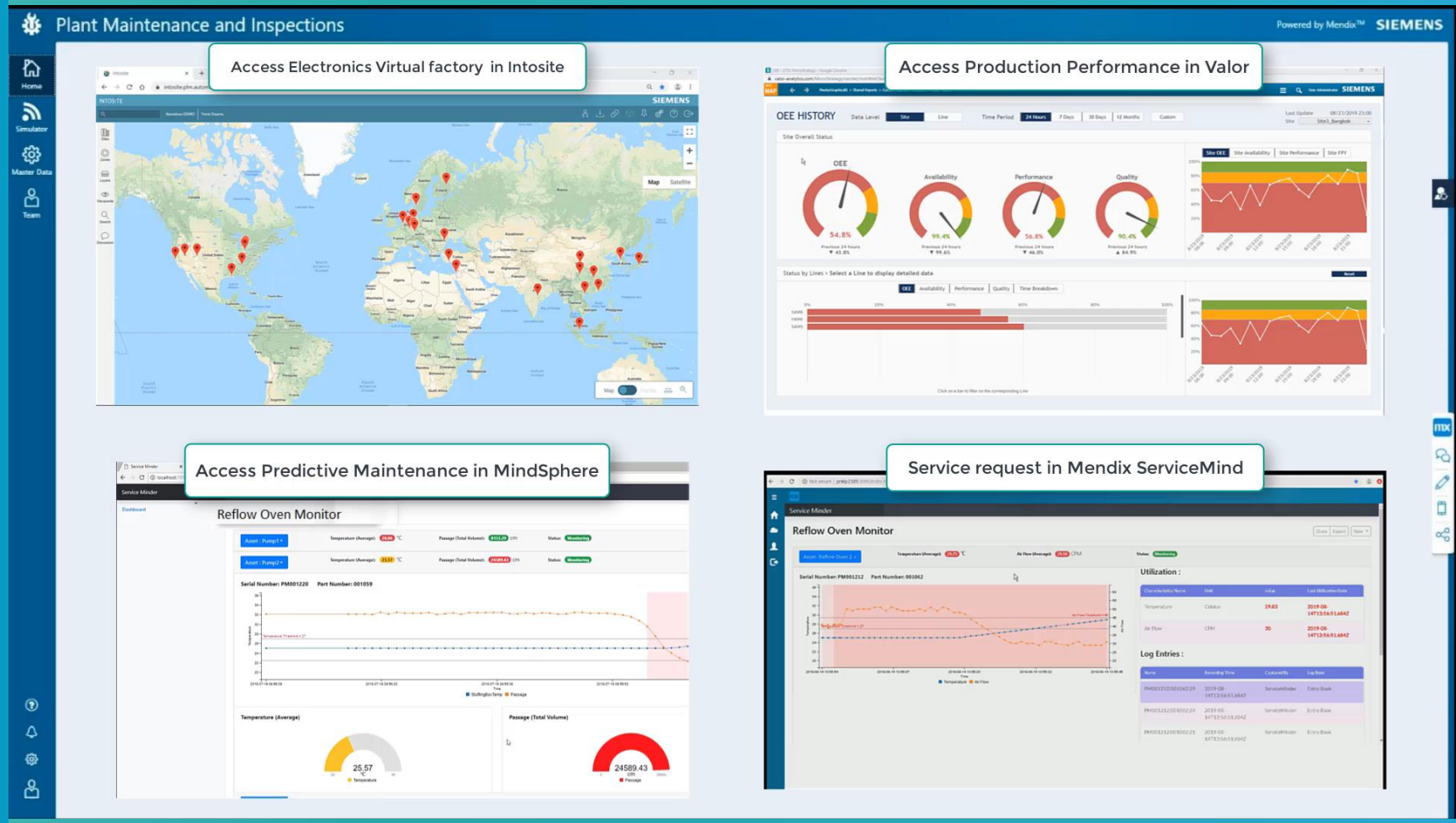
CHALLENGE

Enable customer access to monitor and control work performed at production sites.

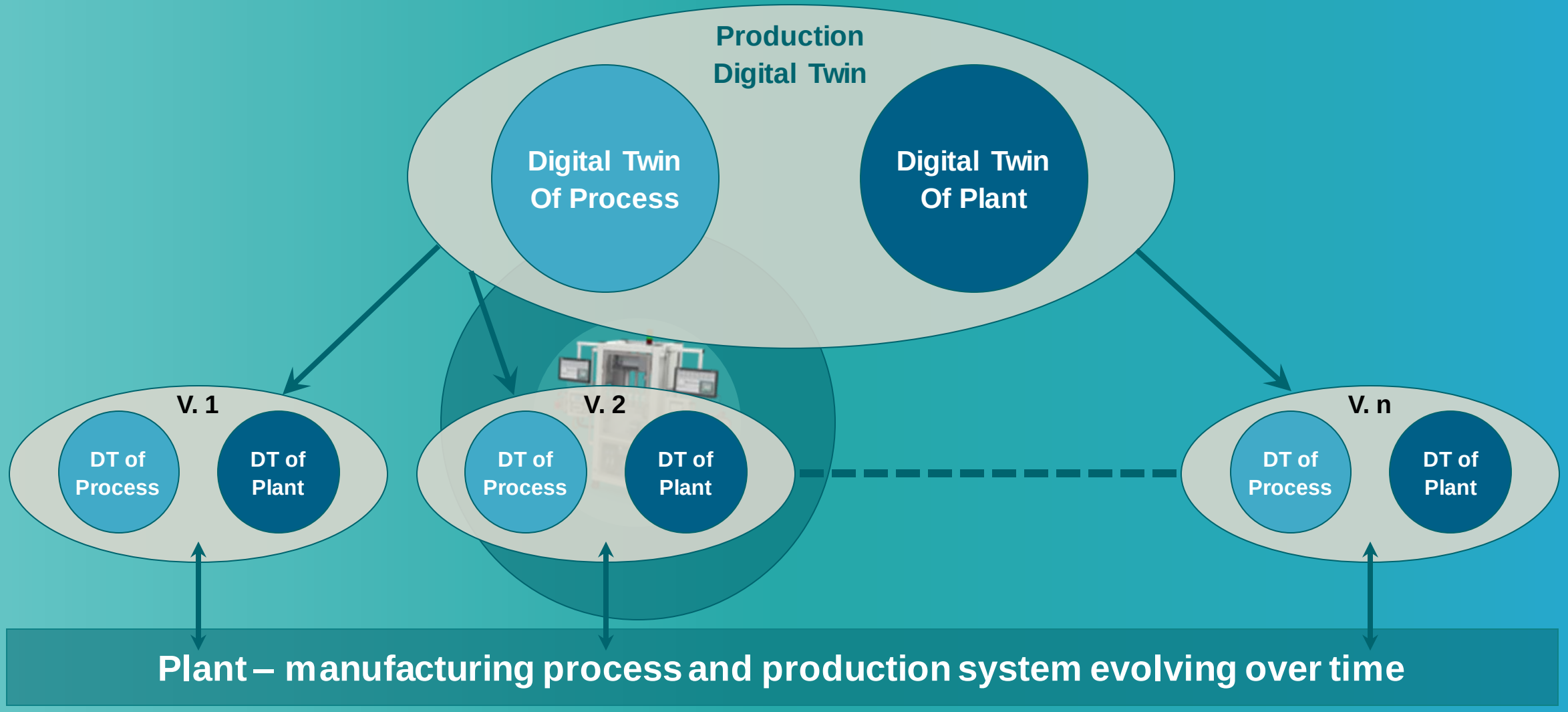
SOLUTION

Intosite + Valor + MindSphere + Mendix

Integrated solution to gain insight into production performance and maintenance.

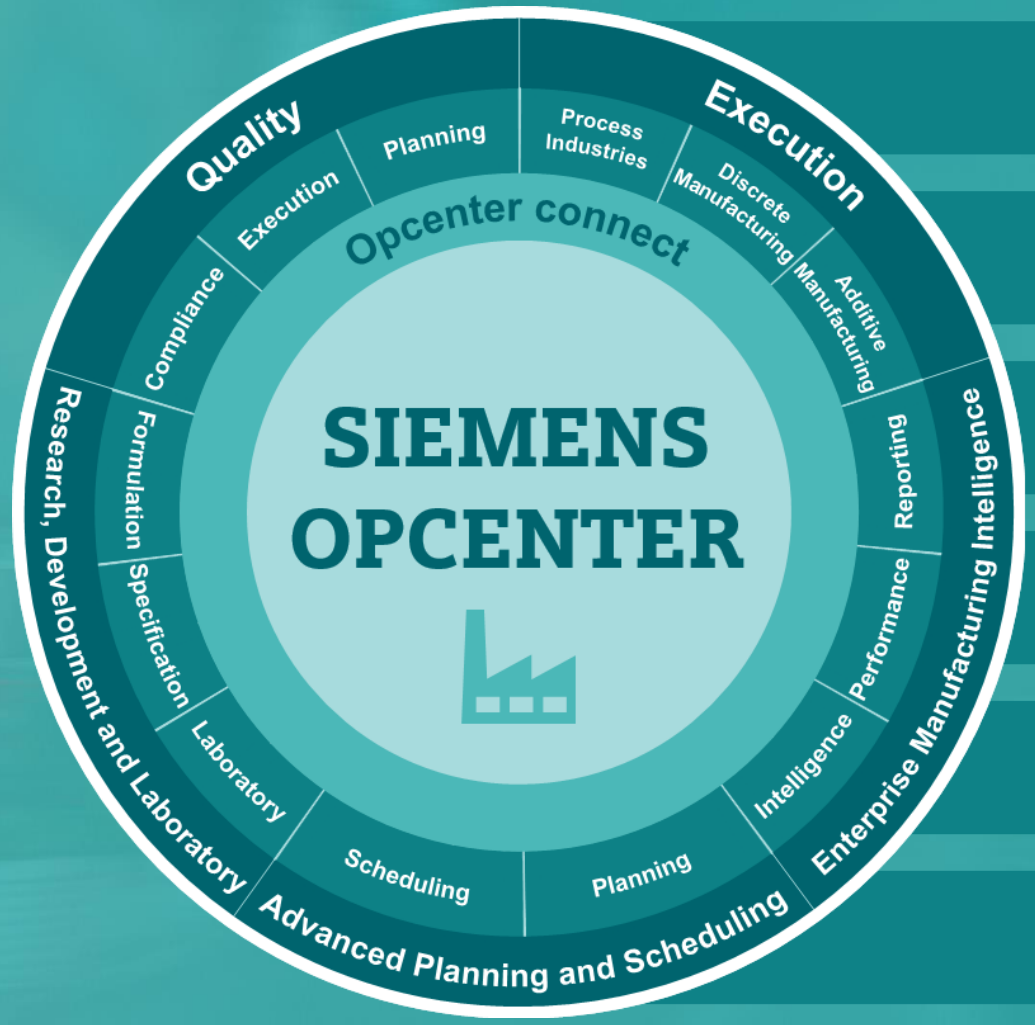


Synchronize the manufacturing process and production system throughout the production lifecycle



Smart Manufacturing through Manufacturing Operations Management

SIEMENS
Ingenuity for life



Implementation of the Digital Twin in the real production

Orchestration and planning of manufacturing and quality operations

Enabling continuous closed-loop improvement through as-planned and as-is data

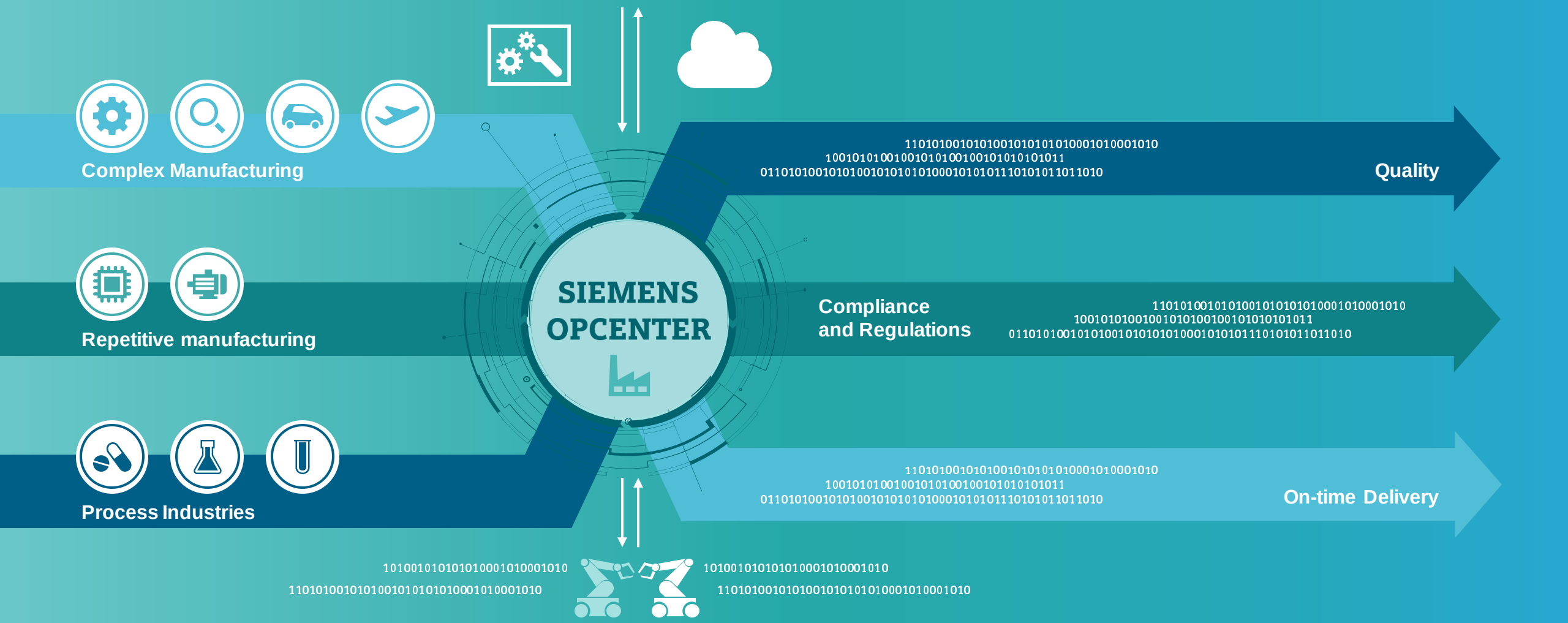
Bridging the gap between enterprise systems and automation

Transforming big data into IoT actionable information (smart data)

Data integration, data analytics and reporting for operational and Enterprise Intelligence

Unrestricted © Siemens 2019

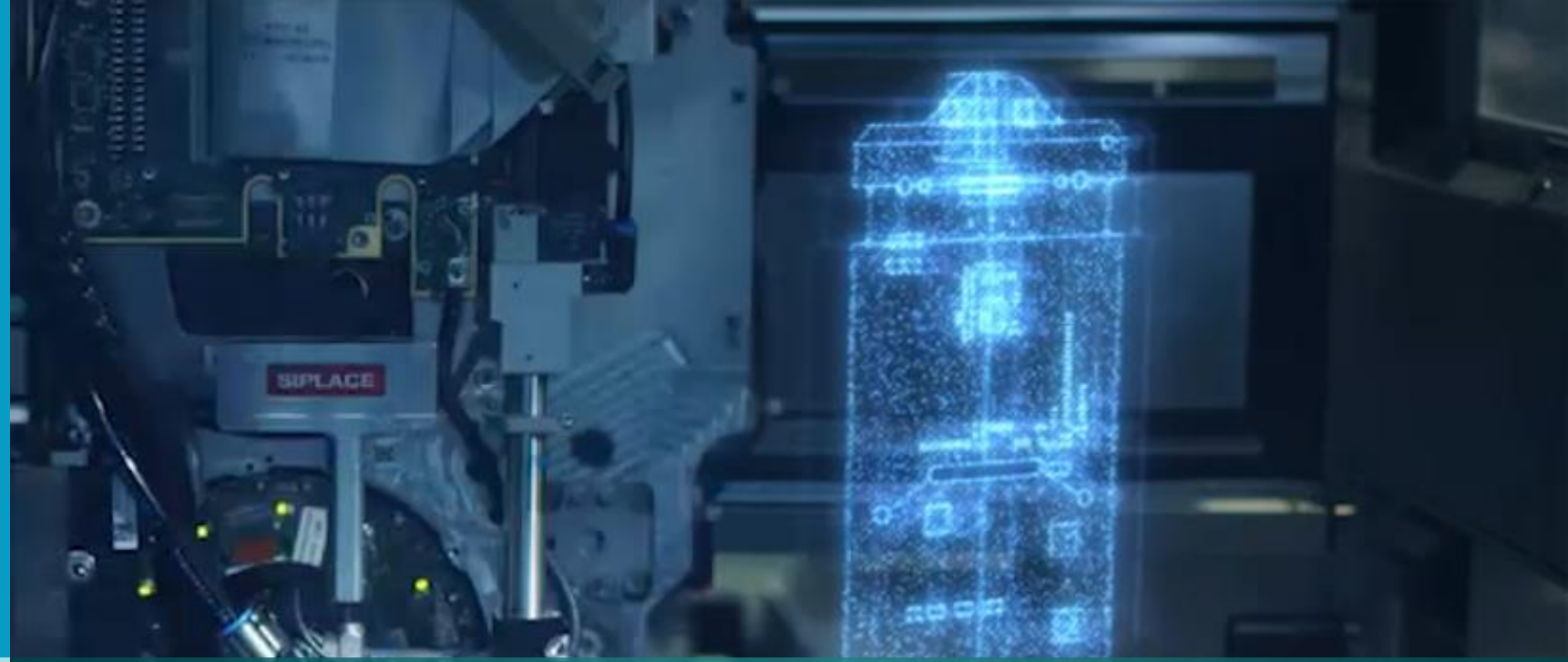
Manufacturing Operations Management: The Digital Brain of the Factory



Electronics Assembly SOLUTIONs

Siemens Opcenter Execution Electronics

Integrated shopfloor solution including scheduling, material management, IoT and analytics.



50% DECREASED NPI TIME

60% REDUCED MATERIAL SEARCH TIME

10% IMPROVED PRODUCTIVITY FOR SMALL LOT SIZES

“Today we have a true one-stop-shop solution for managing Electronics Manufacturing that covers all process areas, as well as material flow and integration with PLM and ERP.”

Hermann Kraus
Manufacturing Manager, Siemens Fürth

VINFAST
VINFAST
LUX A2.0

SOLUTION

Siemens MOM - PLM - Automation

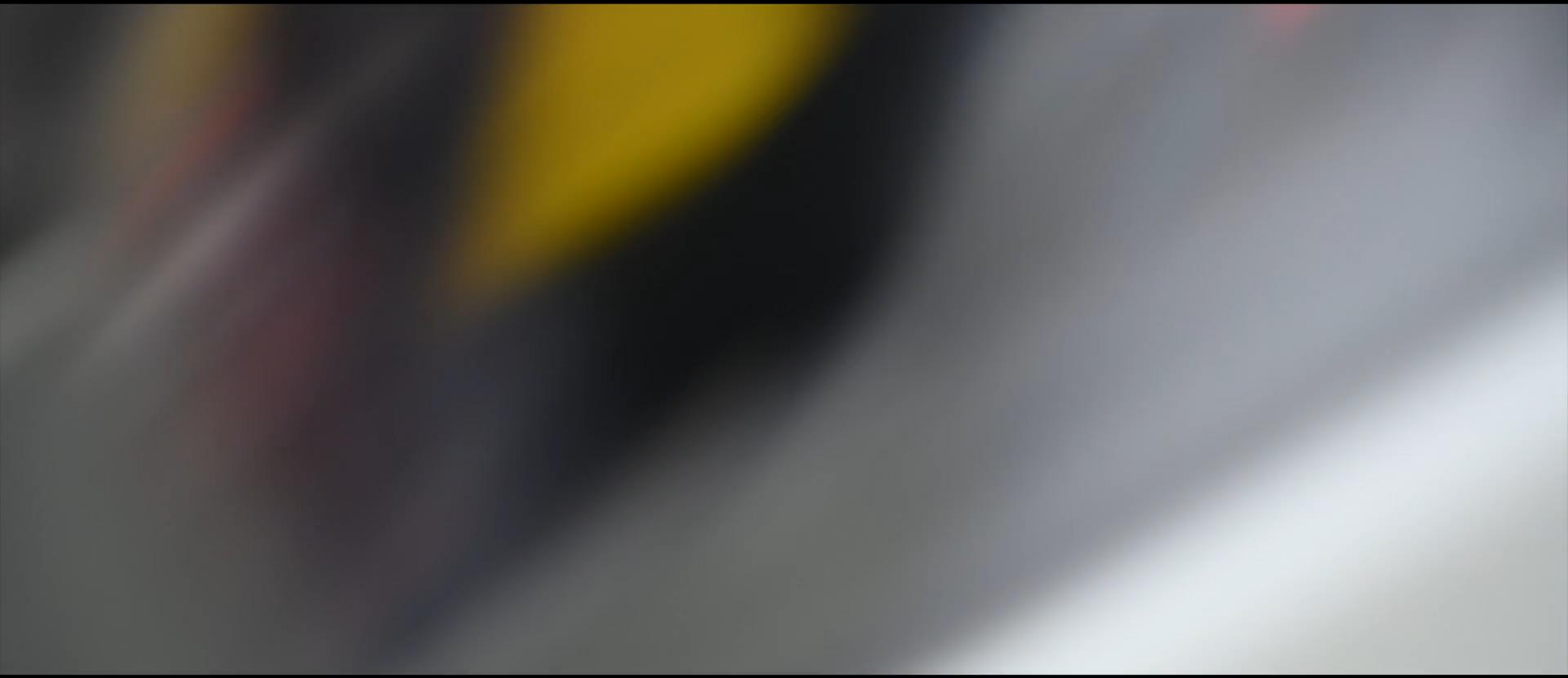
Address the complete product and production value chain by having integrated PLM, MOM and automation.

50% FASTER TIME TO MARKET

FLEXIBLE DEVELOPMENT

EXCELLENT QUALITY

Digital Twin supports unprecedented speed of new factory go-live!



Digitalization is no longer the future. It is already here **today**…

… and we are **implementing** it **alongside** our customers and partners.

Unrestricted © Siemens 2019

SIEMENS
Ingenuity for life

Thank You

Sandvik and Siemens Digital Industry Software are forming a strategic technology and business partnership in order to provide increased value to their joint customers by combining key elements of expertise and software technology related part manufacturing and building on a long standing and successful relationship between the two Companies.

The partnership will expand and foster our customers Smart Factory strategy supporting Industry 4.0 implementations by enabling the integration and interoperability of Sandvik's tool data management and metrology solutions with Siemens NX CAM, NX CMM and TeamcenterManufacturing Resource Library (MRL) software. Based on above integrations data analytics and machine learning capabilities will provide significant productivity gains to our joint customers.

As a result of this important partnership Siemens customers will have extended access to best in class capabilities in the area of tool data management and advanced measurement (metrology) methods which correlated with machining knowledge and analysis will boost manufacturing productivity and help reduce waste before it appears.