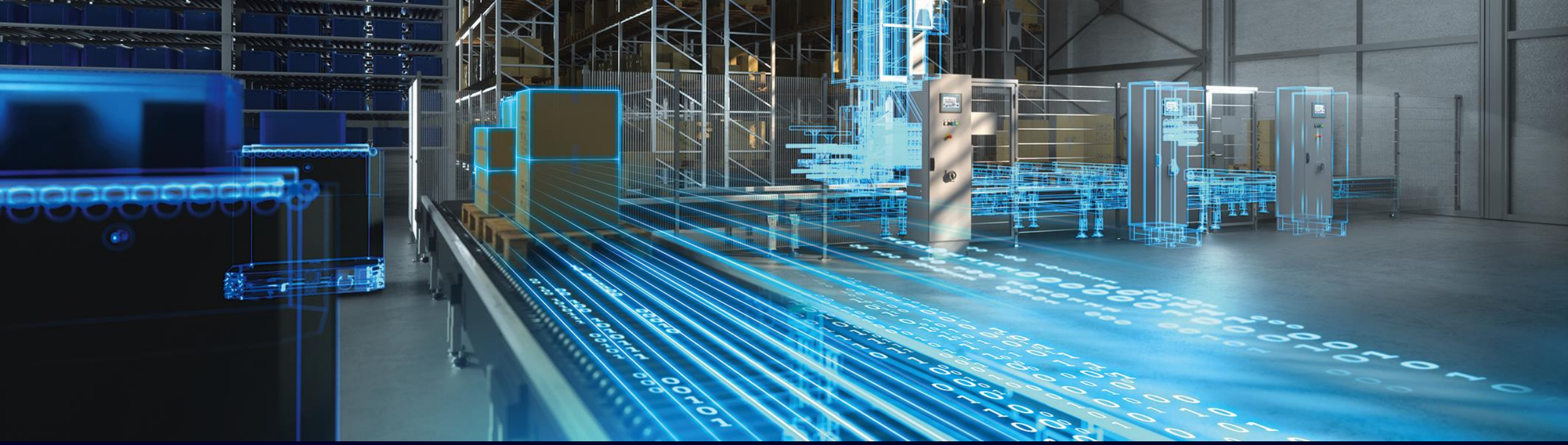


Real Digital Twin

SIEMENS

Vårens webbinarieserie om simulering och virtuell driftsättning

Din digitala väg till snabbare, smidigare och mer kostnadseffektiv utveckling och tillverkning

Generell simulering

SIEMENS

Real Digital Twin

SIEMENS

Junior arbetskraft till senior – på kortare och kortare tid

SIEMENS

Snabb driftsättning och ökad produktionstakt genom produktionssimulering

SIEMENS

Rundabordssamtal om simulation och produktion

SIEMENS

SIEMENS

Real Digital Twin

Fredag 12 mars – 10:00-10:45

Andreas Buhlin
Head of development RDT/ RVC Digitalization, Manager Advanced Manufacturing at AFRY

Hur tekniken som ligger bakom lösningarna ser ut och varför en digital tvilling kan skapa bättre produktionslösningar och öka produktiviteten.

I detta webbinarium kommer Andreas Buhlin från AFRY att presentera deras koncept RDT, som bygger på Siemens simuleringsmjukvaror. Han kommer att berätta mer om tekniken som ligger bakom lösningarna, arbetsmetoderna de använder sig av, samt visa ett par praktiska exempel.

SIEMENS

Real Digital Twin Framework

10100
01011
11010 *We make digitalization work*

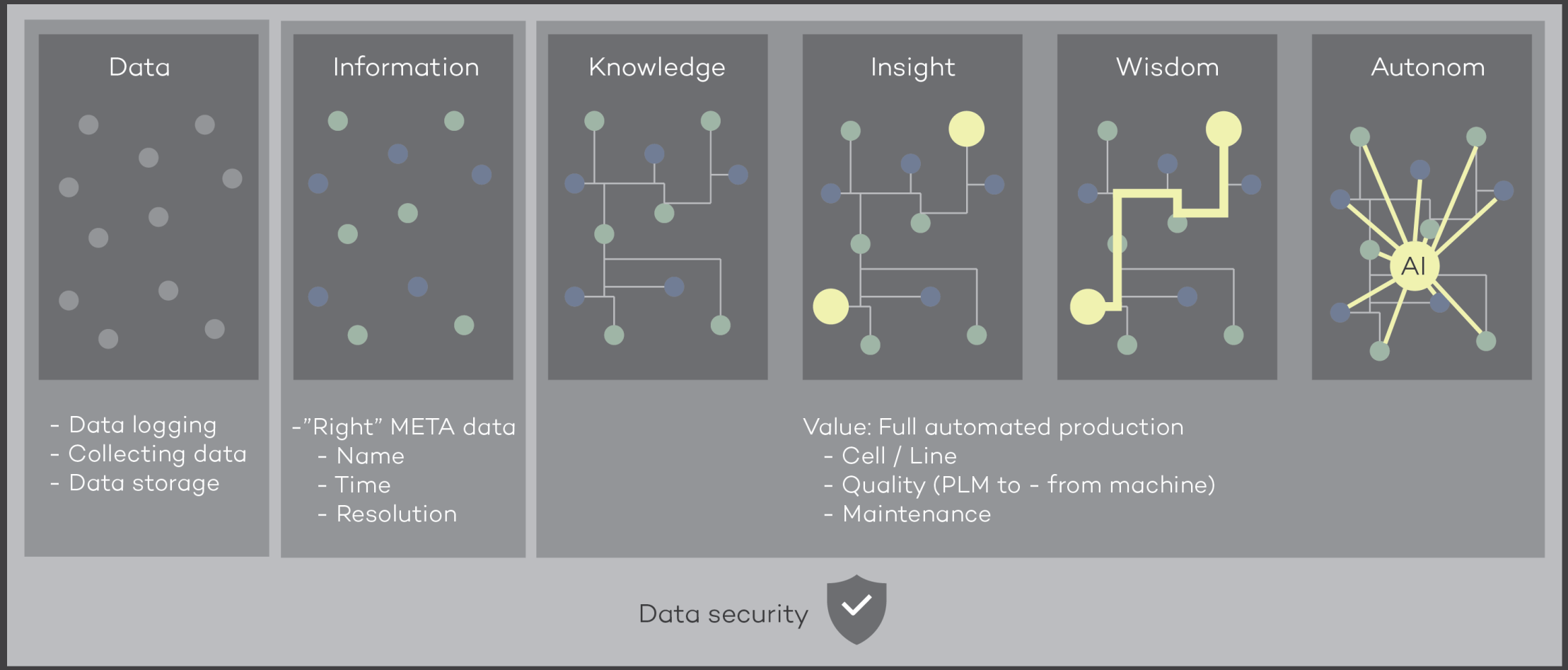
AFRY
ÅF PÖYRY

The demands / requirements for the modern industrial company

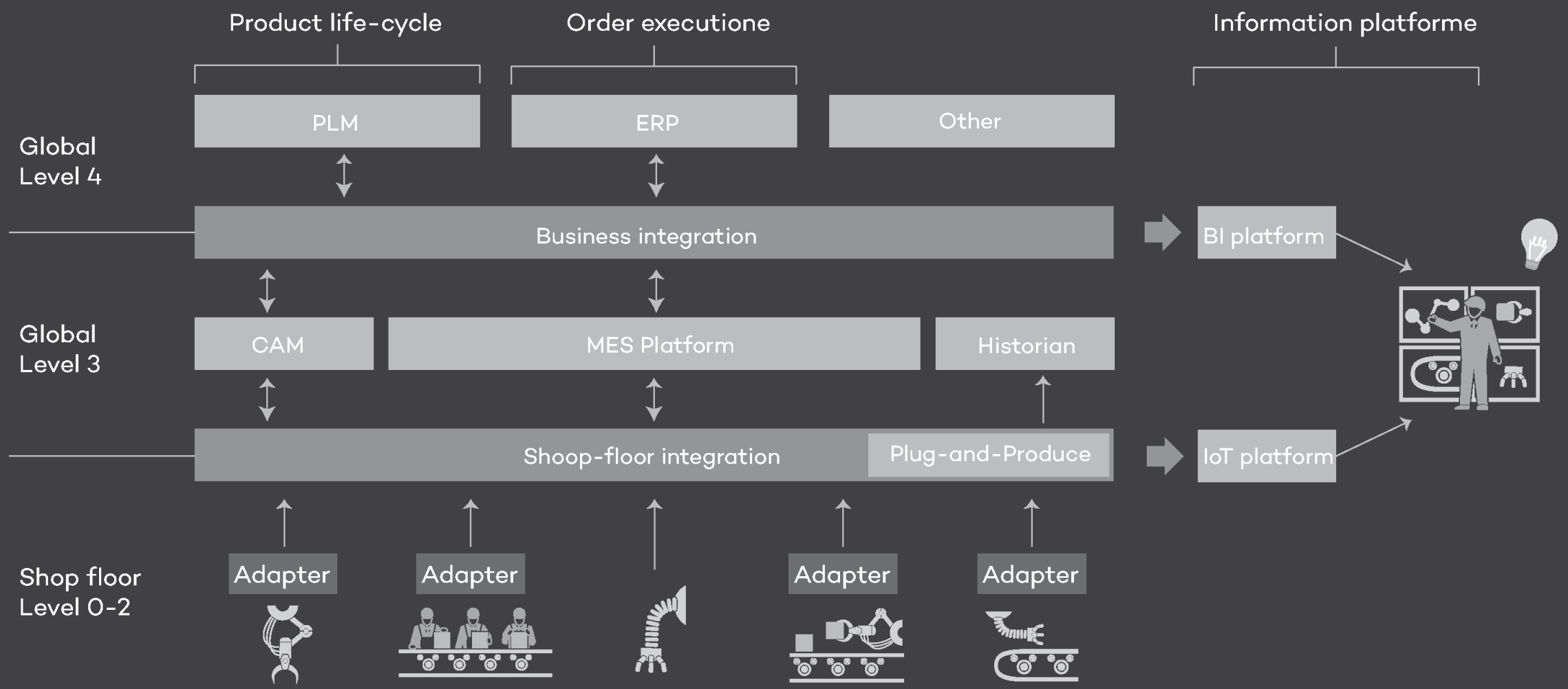
- The customer of the customer wants a unique product, fast
- Fast, flexible, scalable, safe
- Produce for order
- Global, multiple production units in different countries

FROM DATA TO WISDOM

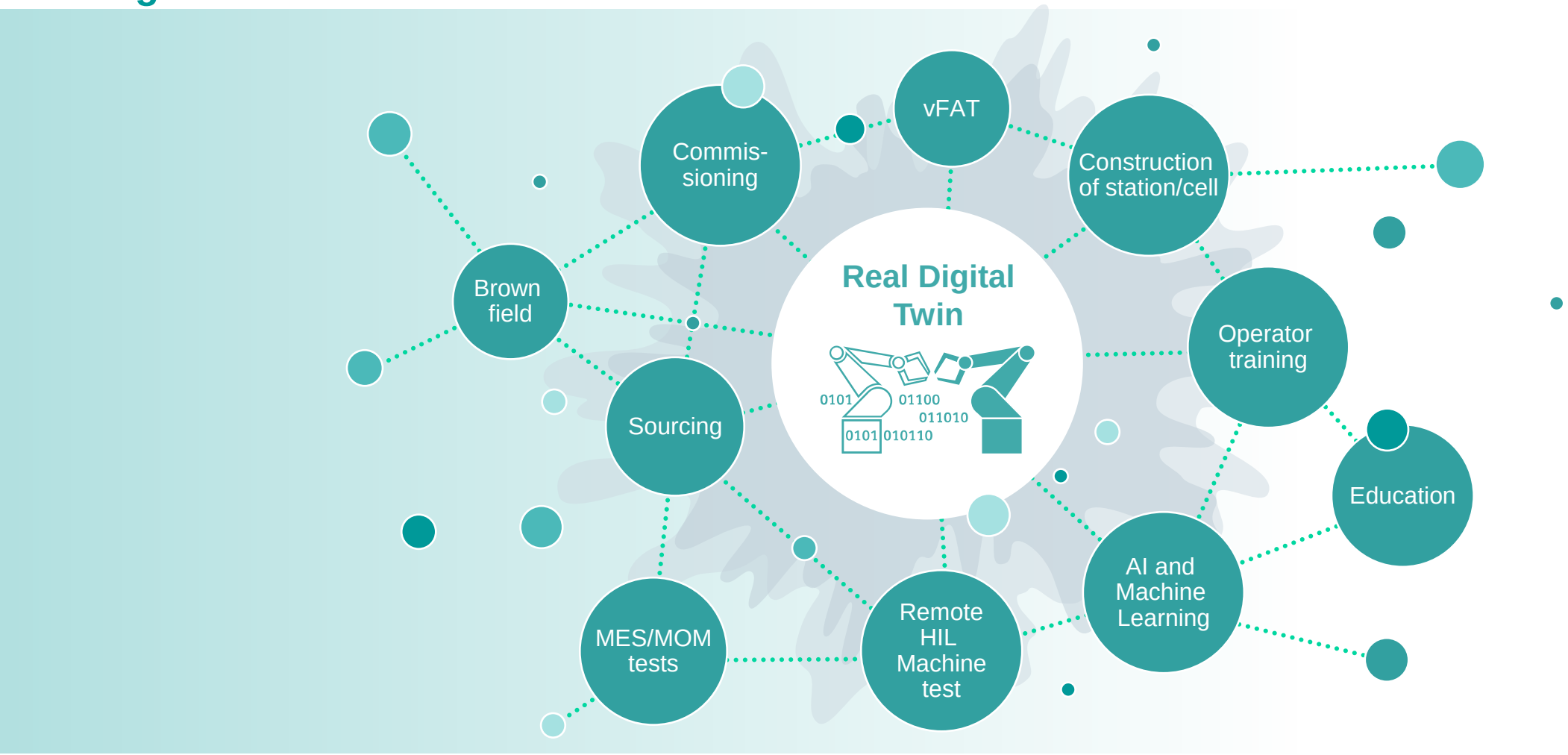
Create value based on data



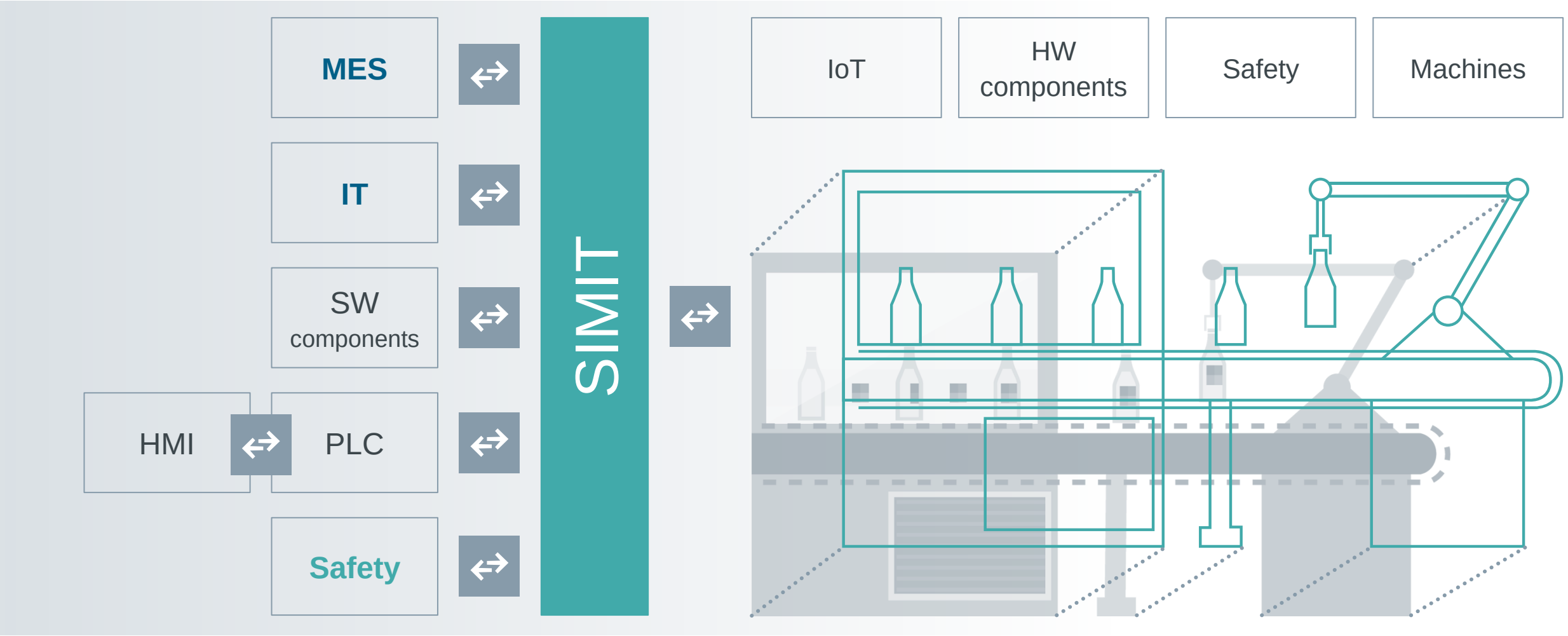
Implementing the Digital Thread



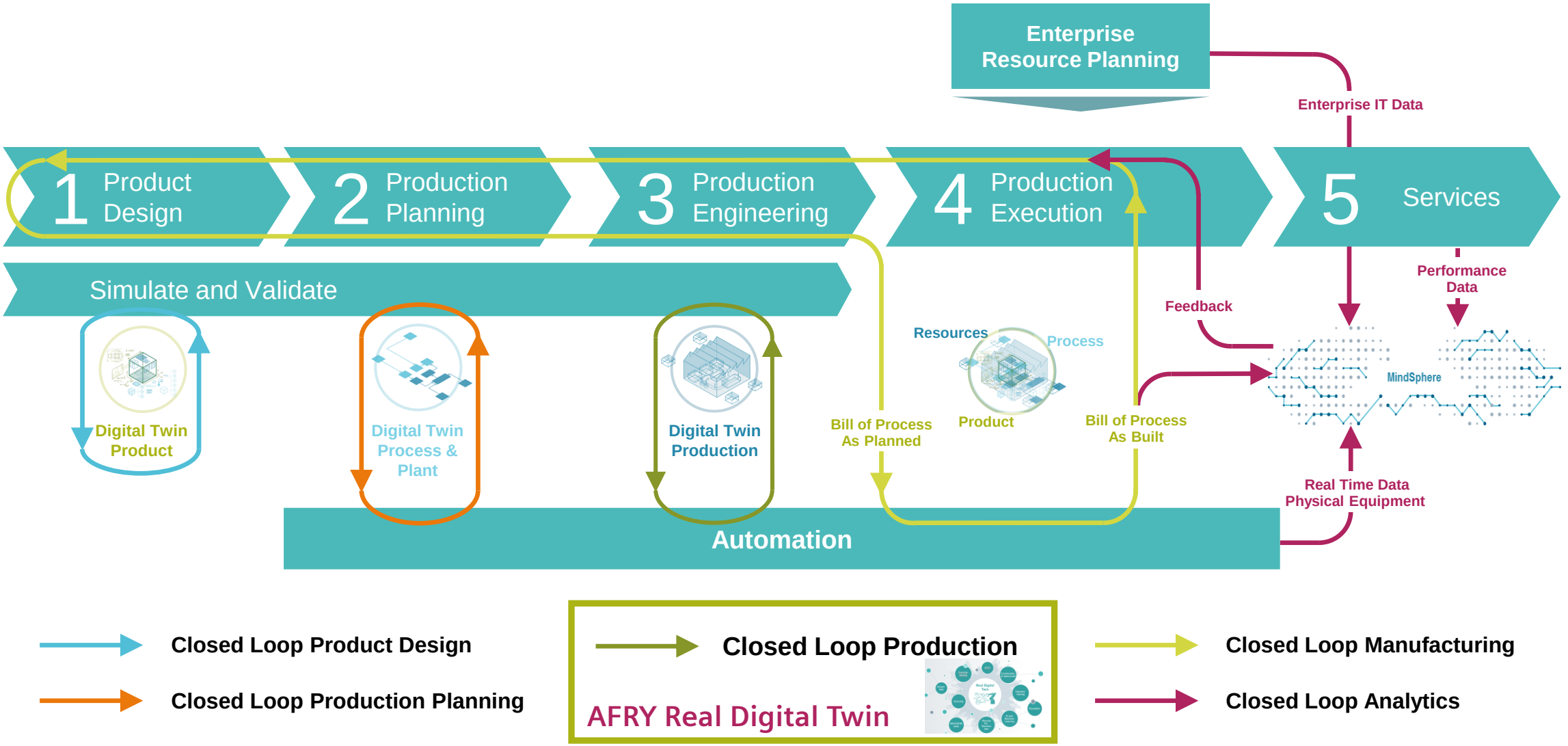
Real Digital Twin

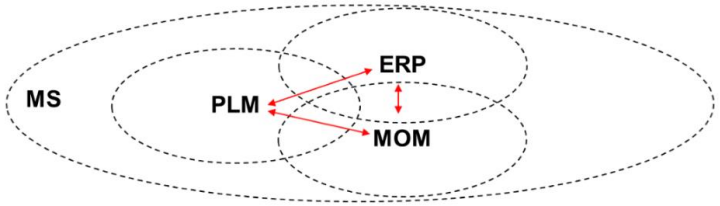


Real Digital Twin
- The architecture



One Digital Twin of Many





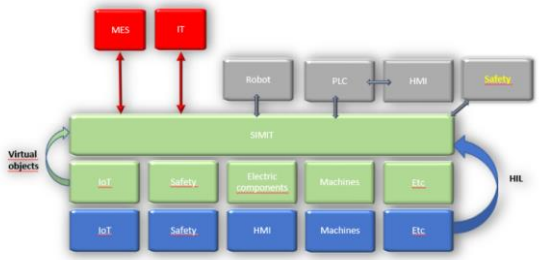
Factory level

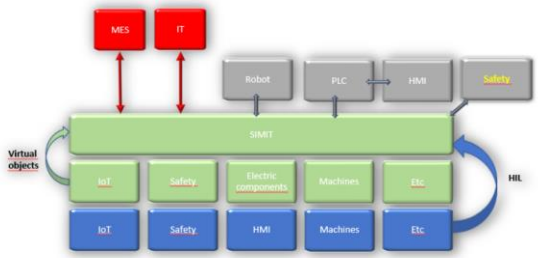
Factory/Plant Simulation

Line level

Line/Process Simulate

Cell level





SIMIT

ERP

PLM / CAD

Team-center

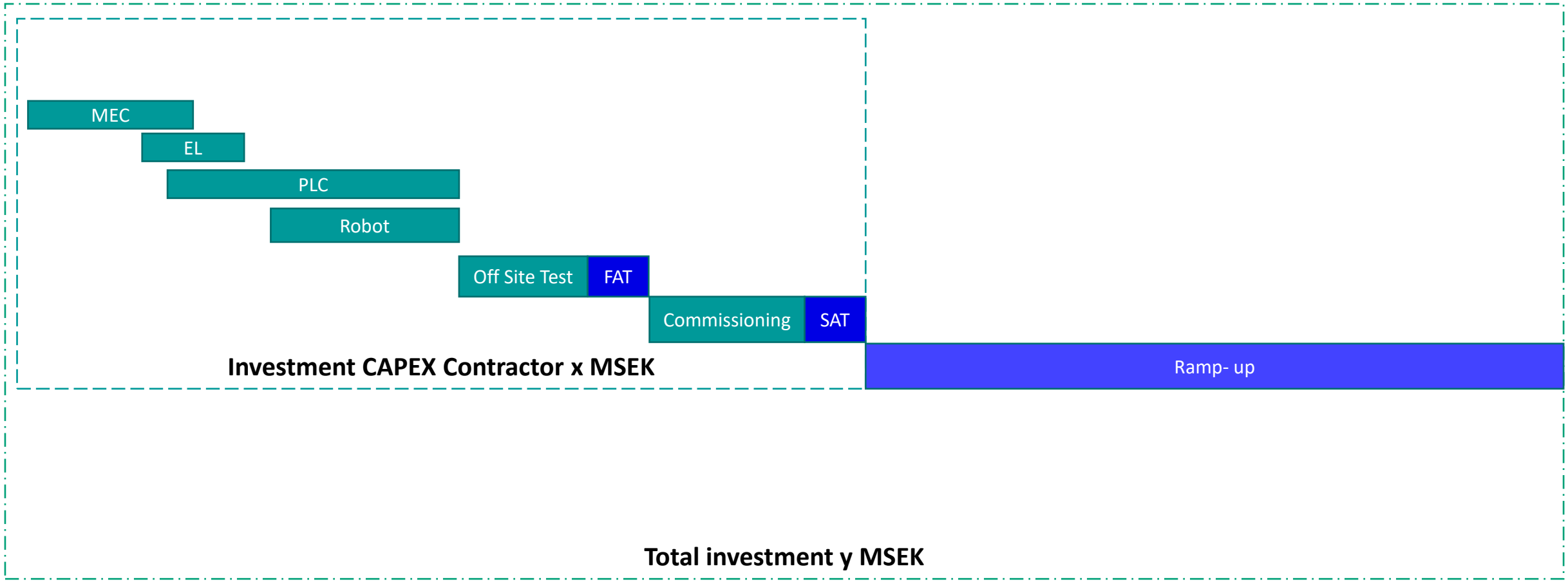
Supply / logistics

SIEMENS

AFRY
ÅF PÖYRY

Ordering and Project Way of Working
-Todays waterfall model

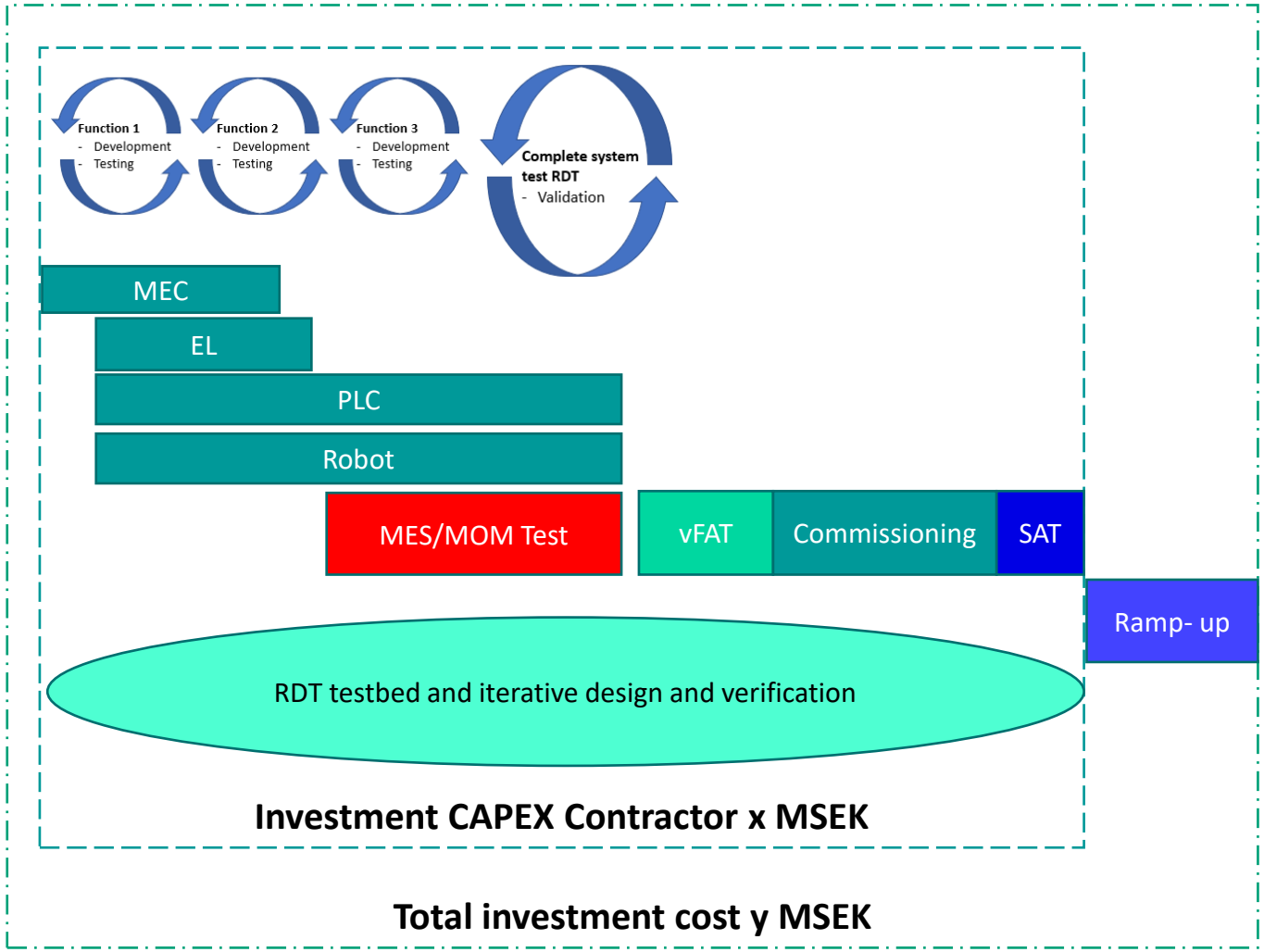
v1 v2 v3 v4 v5 v6 v7 v8 v9 v10 v11 v12 v13 v14 v15 v16 v17 v18 v19 v20 v21 v22 v23 v24 v25 v26 v27 v28 v29 v30 v31 v32 v33 v34 v35 v36 v37 v38 v39 v40



AFRY
ÅF PÖYRY

New Agile RDT Way of Working

v1 v2 v3 v4 v5 v6 v7 v8 v9 v10 v11 v12 v13 v14 v15 v16 v17 v18 v19 v20 v21 v22 v23 v24 v25 v26 v27 v28 v29 v30 v31 v32 v33 v34 v35 v36 v37 v38 v39 v40



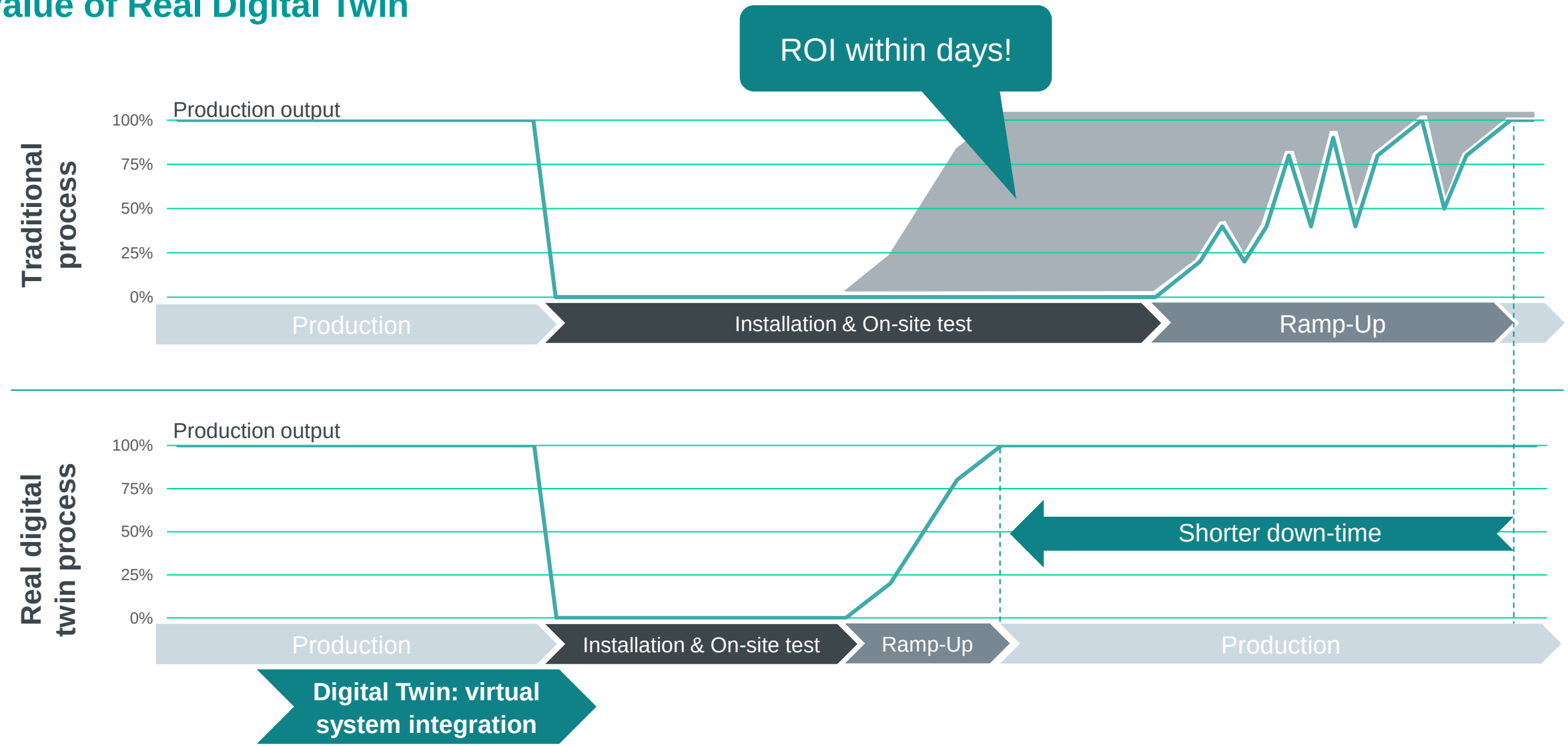
Result

- Reduced total cost
- Better quallity
- Digital Twin

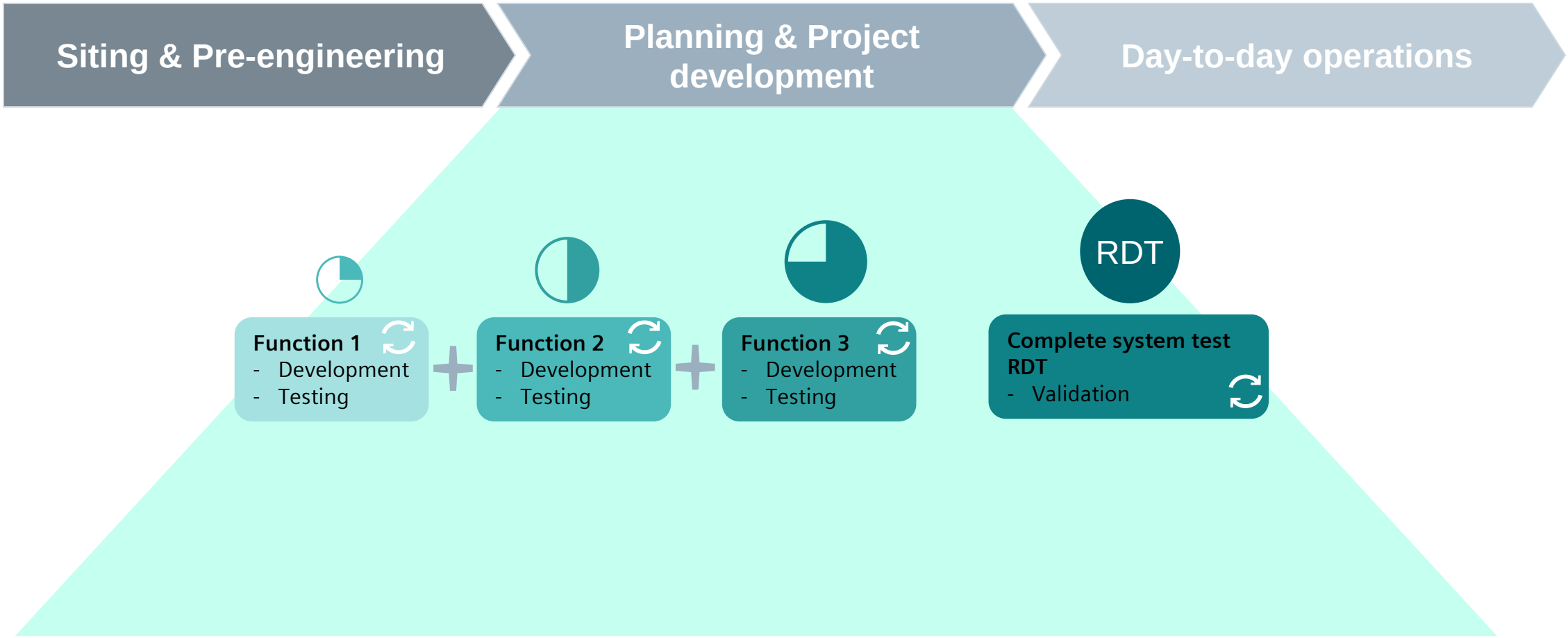
-xx MSek

AFRY
ÅF PÖYRY

Value of Real Digital Twin



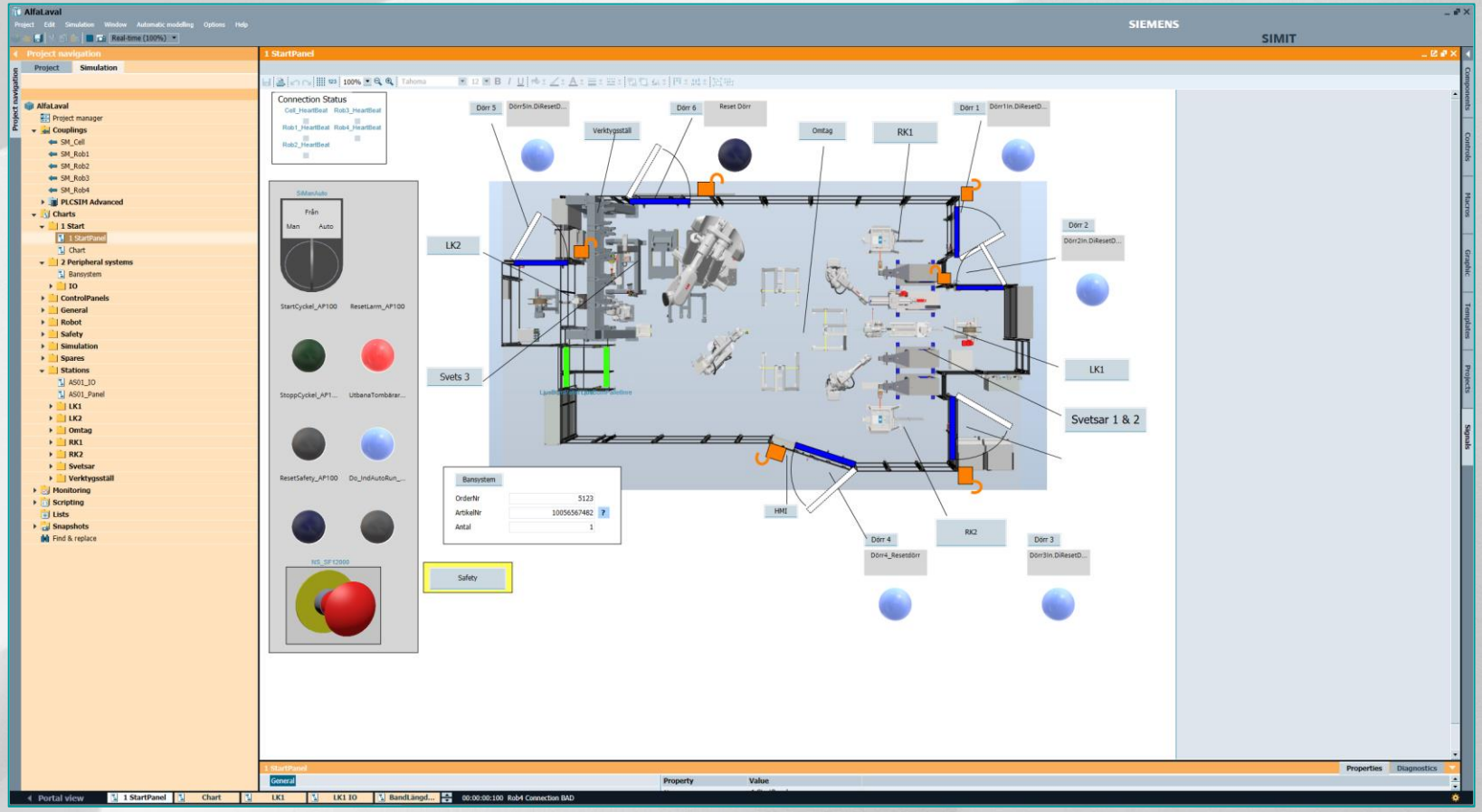
Real Digital Twin – Applicable over complete Asset Lifecycle



Virtual Components

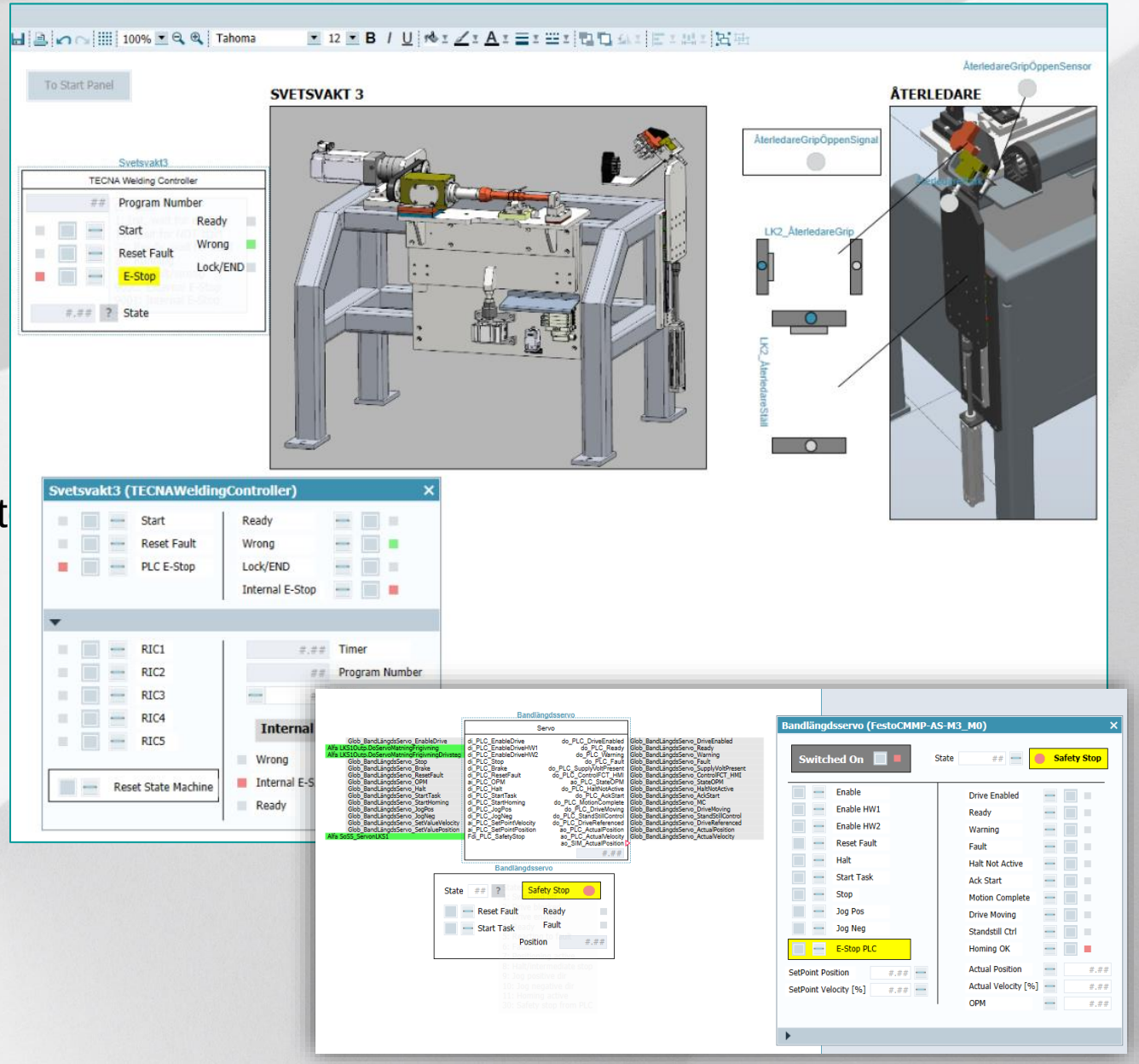
SIMIT Simulation Platform

All equipment in the cell is modelled and visualized in the Cell overview with links to the individual virtual components.



SIMIT Virtual components

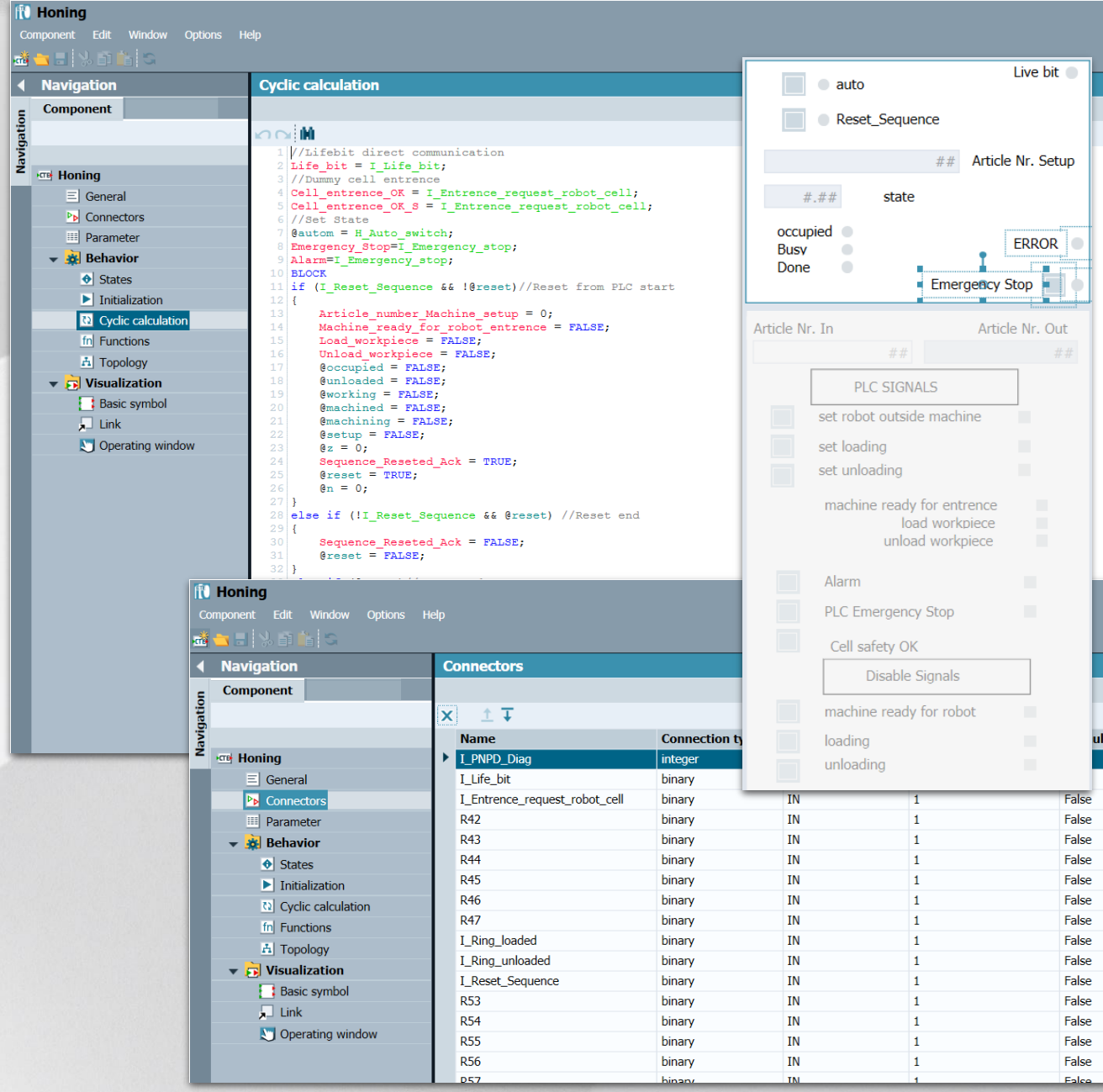
Each virtual component in SIMIT have their I/O connected to the corresponding tag and simulat the signal behavior of the real components.



SIMIT Component Type Editor

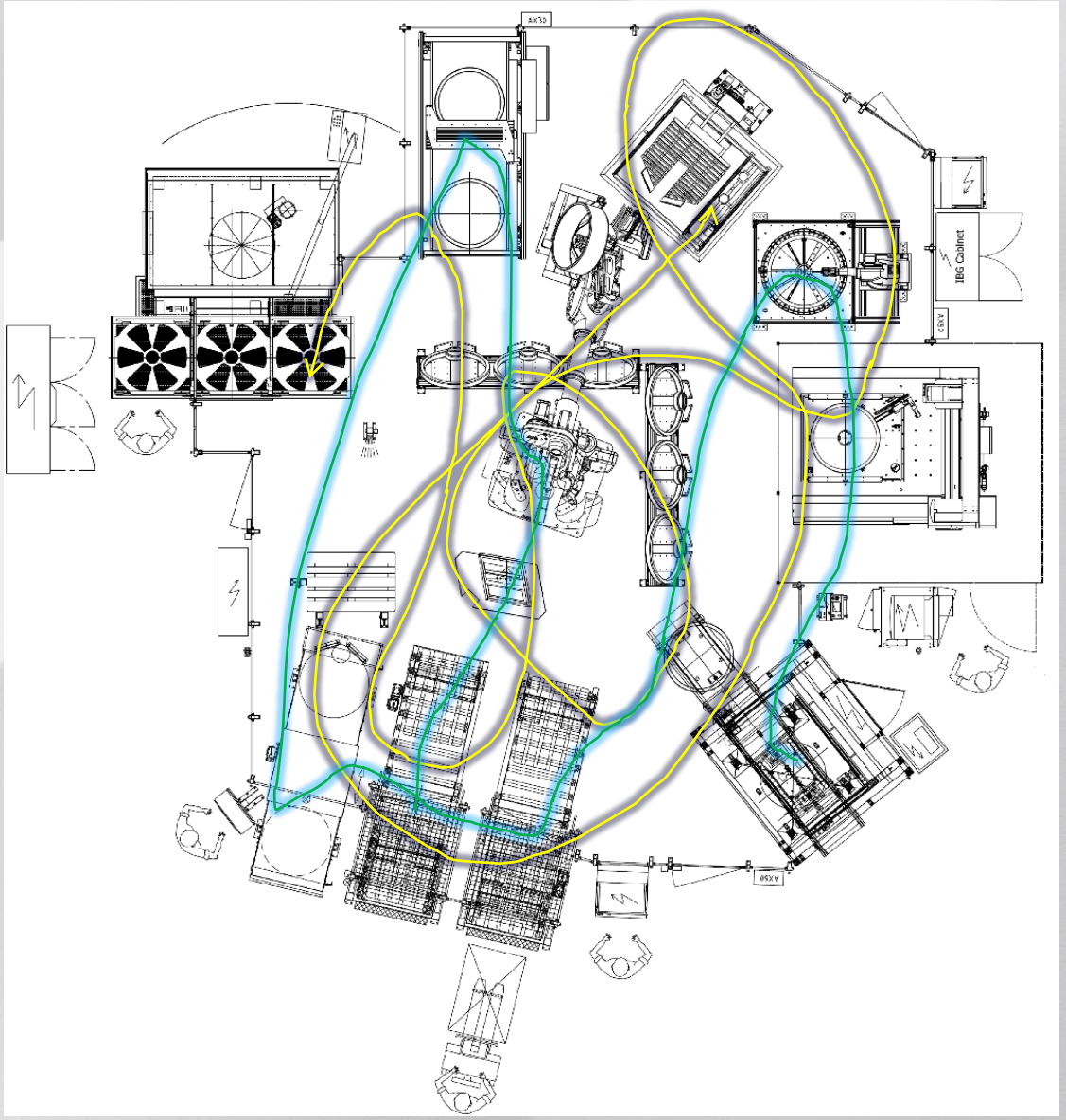
The virtual models of the equipment is developed in SIMIT CTE with signal definitions, signal response and HMI.

The components behavior is programmed with C-code which is executed by SIMIT during the simulation of component.

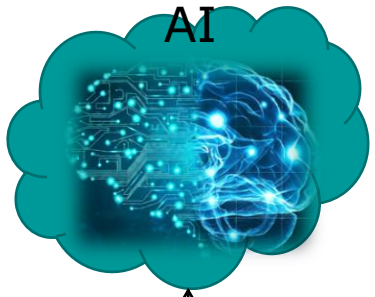


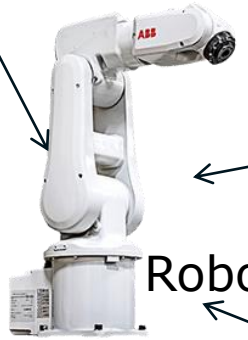
Smart material handling cell

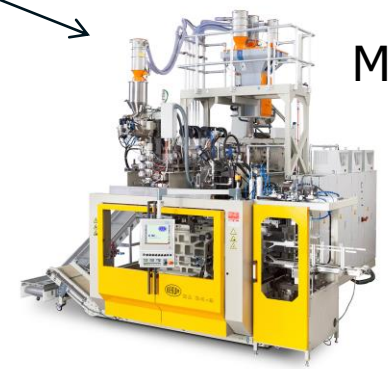
- Unique Products
- Parameter driven production control
- Possibility for parallel flows
- Multiple possible paths
- Independent resources
- Interrelated production flows
- Shifting bottlenecks
- Potential to optimize flow
- Standard interface between control system and machines



Next Step: AI controlled Virtual Production







PackML

PackML

PackML

PackML

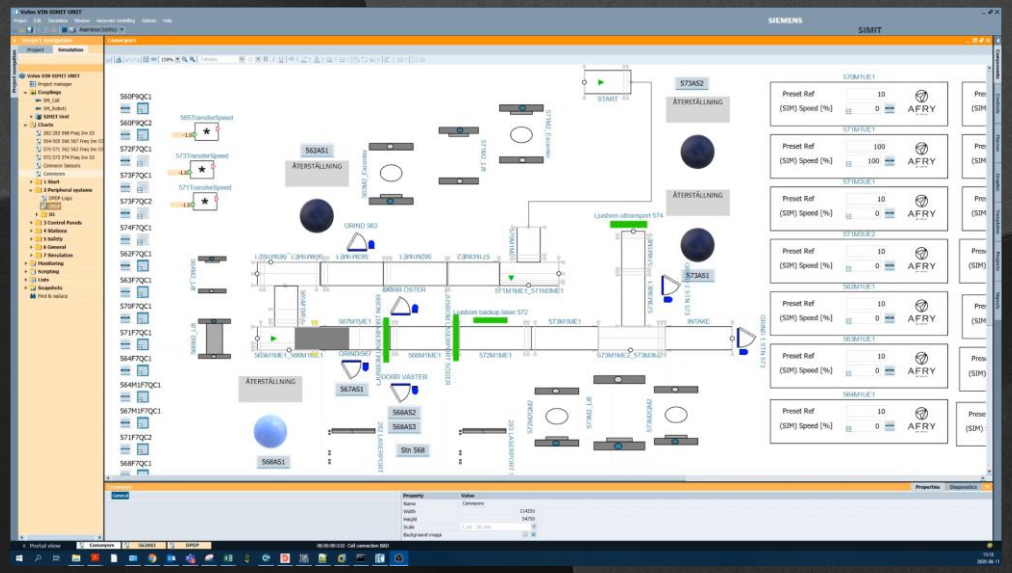
PackML

AFRY
ÅF PÖYRY

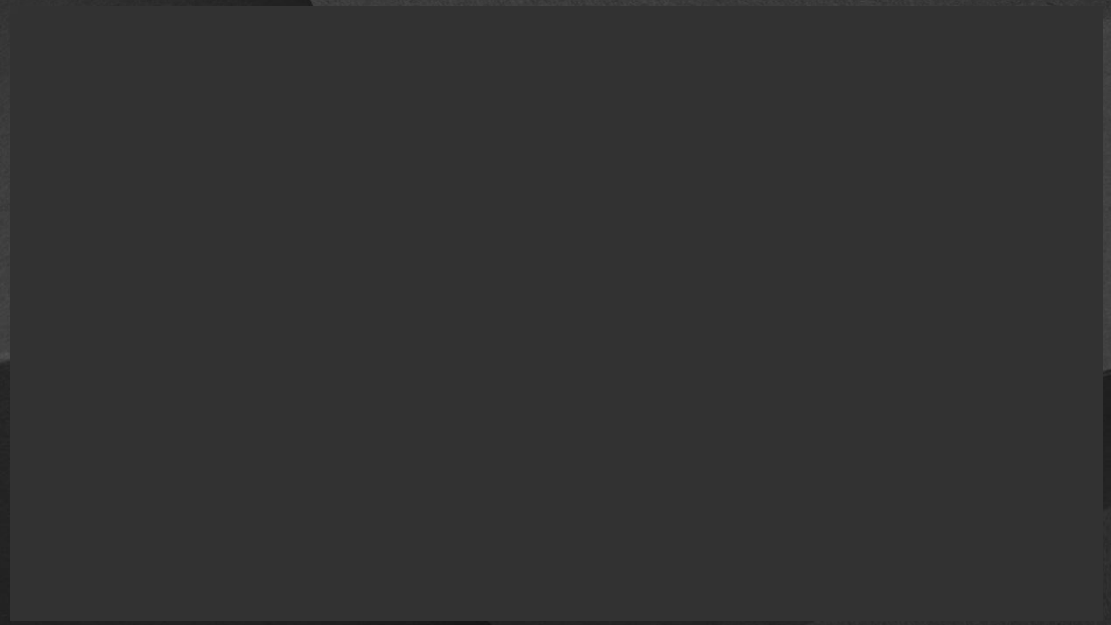
RDT – Baseline emulation with SIMIT

The customer was worried that the new functions would not be finished in time due to a short commissioning and test phase. Therefor it was decided that a RDT of the site would be created with main aim to be able to test the code for the conveyor system, lifting tables, safety concept and integration to adjacent system.

Business case using RDT
Estimated time saved to at least 2 workdays of troubleshooting the PLC code, by using the RDT. This means a two workdays delay in production start with a loss of approximately 1 car/minute. Estimated savings in MSEK.



RDT – Emulation Robot cell with VR, graphics and physics



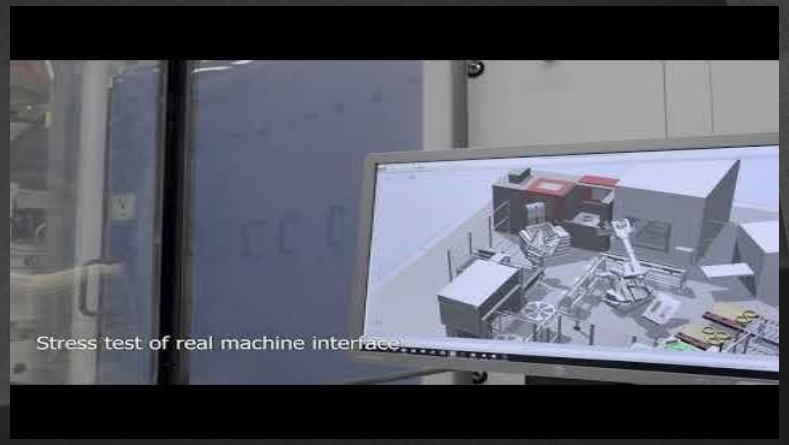
RDT – Food&Pharma

RDT – Different usage examples

Operator Training in VR

— Real Virtual Commissioning Part 3 Operator Training - YouTube

HIL – Machine validation



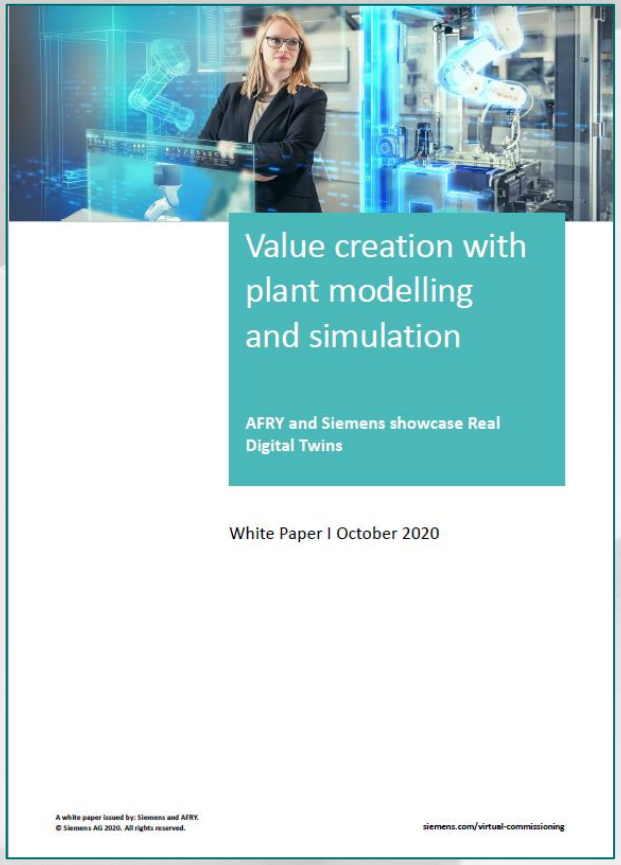
Real Virtual commissioning with Hardware In The Loop - YouTube

MES/MOM realtime test

https://youtu.be/LlqrTbGbgbE

WHITE PAPER

Value Creation with Plant Modeling and Simualtion



Download

www.siemens.se/simulering

AFRY
ÅF PÖYRY

How to start?

Think big, Start small

It’s really easy, start with one object!

https://afry.com/en/competence/real-digital-twin-framework

Real Digital Twin

Real Virtual Commissioning - and more

The Game Changer

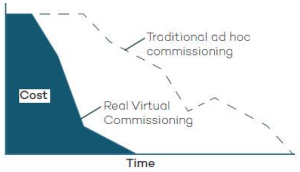
Using a Real Digital Twin of your production for commissioning and ramp-up can save you a lot of trouble, and up to 75% of the costs compared to traditional commissioning and ramp-up ad hoc.

What is a Real Digital Twin?

Real Virtual Commissioning (RVC) creates an exact digital twin of your production system including machines, sensors and actuators. It enables control of the reality through emulating plant modifications in a 100% accurate digital copy of your production environment before making changes to the actual plant.

With RVC, you can run 100% of operational testing without production stops when building or modifying a plant, which eliminates unnecessary downtime (both planned and unplanned) during commissioning and ramp-up.

Financial Benefits



The net achieved effect: a saving up to 75% to the costs and time of traditional practices.

Working with RVC Drives Value

Faster RVC reduce risk and saves time.

Better Increased performance and profits.

Safer Use the digital twin to train operations and maintenance staff. Avoid the risk of downtime or revenue loss.

Simulation vs. Emulation

A simulator copies something from the real word into a virtual environment – often to give you an idea about how something works. It simulates the basic behavior but doesn't necessarily abide to all the rules of the real environment that it simulates.

An emulator, on the other hand, duplicates the thing exactly as it exists in real life. The emulation is efficiently a complete imitation of the real thing – it just operates in a virtual environment instead of the real world.

Experience Your Digital Twin in Virtual Reality

The digital twin is built in 3D and using VR glasses you can step into your future production system and experience all aspects of it.

Based on Siemens technology

Typical Surprises Found During Ramp-Up and Production

- Machines interfaces i.e. measuring devices
- Operator interaction
- ERP data exchange
- MES/MOM data exchange
- Specifications not 100%
- Sequences
- Unusual modes
- Unpredicted dependencies

Think Big, Start Small

To stay in front, your company will have to start the digital journey to a more architectural approach and work cross-functional to find the issues that occur between competences.

It´s important to think big and have great visions, and a good idea to start small and measure the savings in one area at a time. AFRY can help your company point out the direction and take the first step.

AFRY
ÅF PÖYRY

Simulering
Real Digital Twin – 12 mars, 10:00-10:45

I dagens webbinarium om **Real Digital Twin har** Andreas Buhlin från AFRY presenterat deras koncept RDT, som bygger på Siemens simuleringsmjukvaror. Han har även berättat mer om tekniken som ligger bakom lösningarna, arbetsmetoderna de använder sig av, samt visat ett par praktiska exempel.

Du har även fått insikt och kunskap om hur det med hjälp av simulering är möjligt att:

- Minska riskerna för ökade kostnader som kan uppstå vid förändrar i produktion
- Undvika blandad kvalitet och skapa bättre produktionslösningar
- Öka produktiviteten i produktion genom att virtuell optimering i en säker, riskfri miljö
- Reducera time-to-market med krav på snabbare omställning i produktion

SIEMENS

Frågor?

SIEMENS

Vårens webbinarieserie om simulering och virtuell driftsättning

Din digitala väg till snabbare, smidigare och mer kostnadseffektiv utveckling och tillverkning

SIEMENS

Kontakt

Elin Nordmark
Siemens AB
Digital Industries
Mobil +46 70 7281191
E-mail elin.nordmark@siemens.com
LinkedIn: www.linkedin.com/in/elin-mk-nordmark-64705a60

Andreas Buhlin
AFRY
Mobil: +46 72 521 43 64
E-mail: andreas.buhlin@afry.com
LinkedIn: linkedin.com/in/andreasbuhlin/

Elin Nordmark
Country Product Manager
Digitalization

Andreas Buhlin
Head of development RDT/ RVC Digitalization, Manager Advanced Manufacturing at AFRY

SIEMENS