

A hand is shown reaching out from the left side of the frame, with the index finger pointing towards a digital globe of the Earth. The globe is composed of a wireframe mesh of white lines and dots, set against a dark blue background with a blurred city skyline at night. The overall theme is digital technology and global connectivity.

# DIGITAL TRANSFORMATION

Balint Rehak

14.0 Bosch Rexroth

# BOSCH GROUP



MOBILITY  
SOLUTIONS

60%



INDUSTRY  
TECHNOLOGY

9%



CONSUMER  
GOODS

24%



ENERGY & BUILDING  
TECHNOLOGY

7%

## KEY FIGURES



394 500 associates (2020)



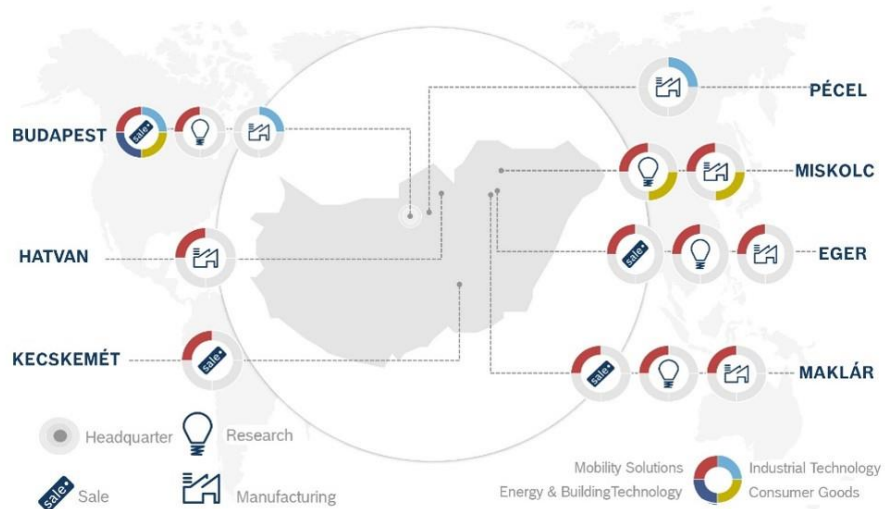
71,6 bn EUR income (2020)



BOSCH REXROTH IS PART OF BOSCH GROUP: WE ARE THE DRIVE & CONTROL COMPANY

# ADRIATIC REGION

## BOSCH GROUP IN HUNGARY



## BOSCH REXROTH'S OFFERING

Icon: Lightbulb with gear inside.

TECH.  
CONSULTING

Icon: Factory with Wi-Fi signal.

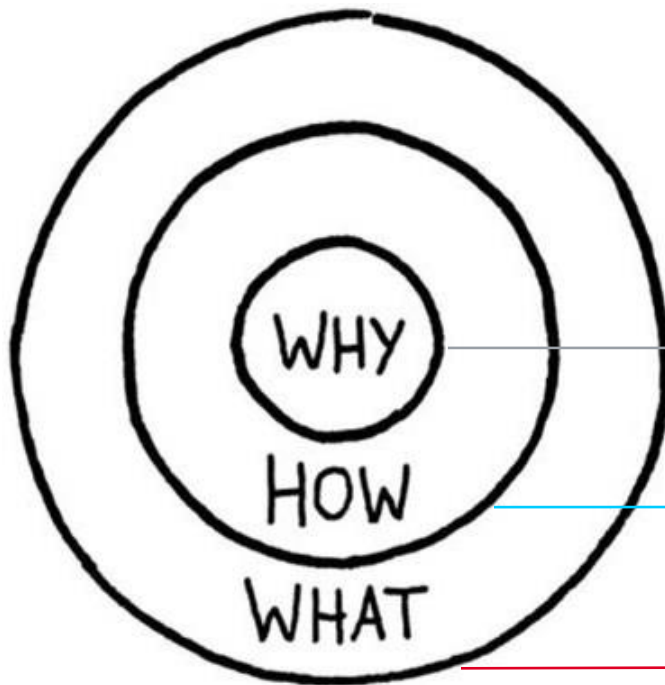
INDUSTRIAL  
TECHNOLOGY

Icon: Buildings.

ENERGY  
MANAGEMENT

REXROTH ACQUIRED EXTENSIVE EXPERIENCE WITH ITS PROVIDED SOLUTIONS FROM 270 BOSCH FACTORIES WORLDWIDE

# CONTENT



## MARKET INSIGHTS

*Status & trends*

## VALUE SELLING

*Digital transformation journey*

## SOLUTIONS

*Business value*



WHY?  
*Market insights*



# MARKET AT A GLANCE

## GLOBAL TRENDS

64%

of CEOs believe technology will disrupt how they do business in the next 5 years

73%

of global companies invest in IoT and value it as top priority technology in the next years

47%

of decision-makers say IoT is the key tech. for efficiency increases & cost optimization

## LOCAL POTENTIALS



### *Government*

- Local Subsidies
- EU directives for Sustainability



### *Bosch Group Hungary*

- Providing Management & Technology Consulting services



### *End users*

- Subsidy based investments
- CAPEX/OPEX business trans. guidance

DIGITALIZATION OF THE HUNGARIAN INDUSTRY SECTOR GAINS MOMENTUM



HOW?

*Digital transformation journey*

# CLIENTS' VIEW

## 1. RESILIENT

Achieve sustainable business growth in a dynamically changing environment

## 2. OPTIMIZED

Streamlined processes, based on Lean principles enabling Digital Transformation

## 3. AGILE

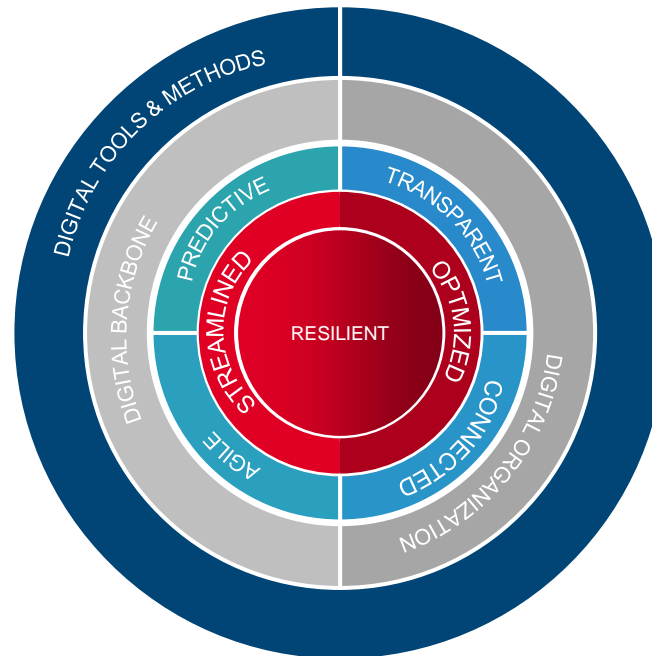
Employees and systems are able to rapidly adapt to changing conditions

## 4. TRANSPARENT

Live data is measured, processed and available to the right people or systems any time

## 5. CONNECTED

IT-Systems, assets, products and employees are enabled to communicate to each other



## 6. PREDICTIVE

Relevant data is used to support operational functions with analytics-based insights

## 7. DIGITAL BACKBONE

A standardized IT-infrastructure enables E2E workflows and complete integration

## 8. DIGITAL ORGANIZATION

Organizational Structure, Leadership, Working methods and employees' qualifications & skills are adopted to the requirements of Digital Operations

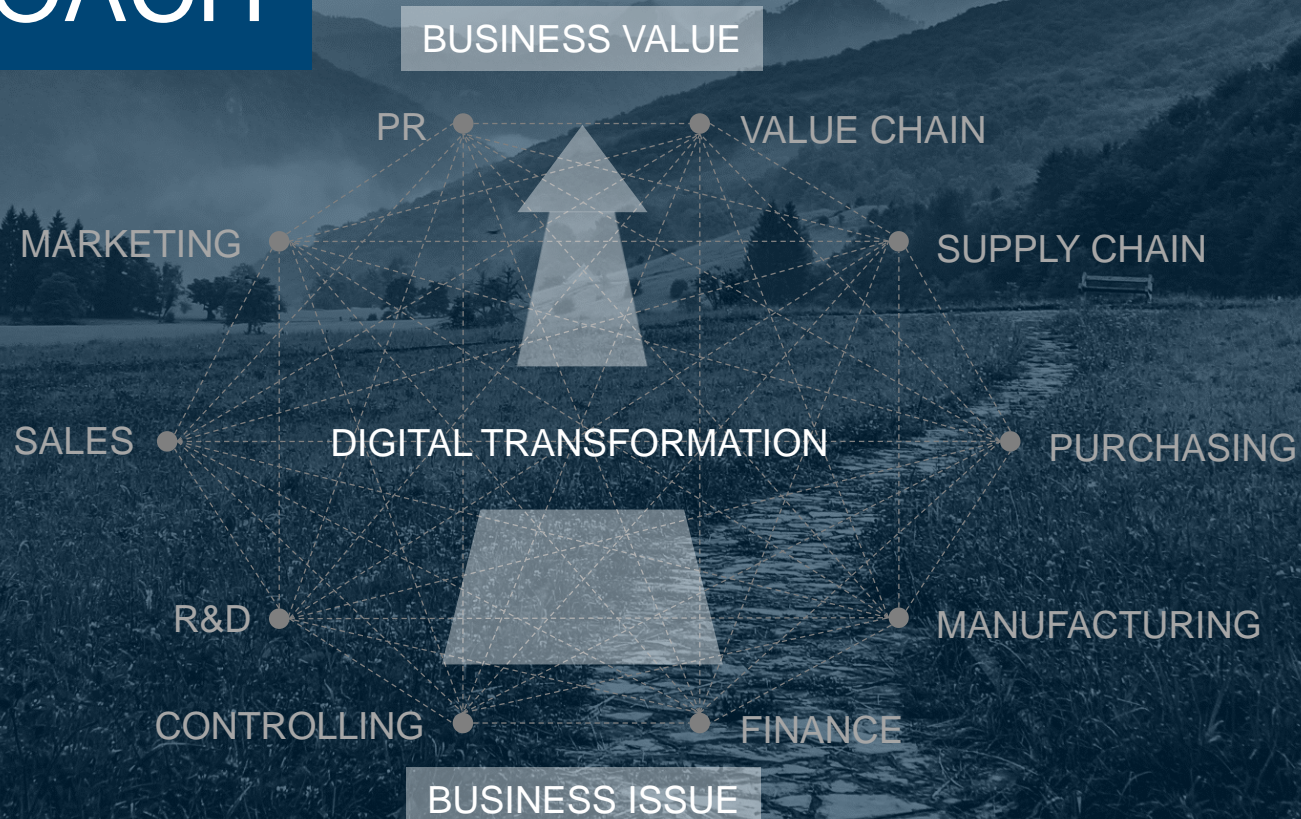
## 9. DIGITAL TOOLS & METHODS

Digital Use Cases adapted to the client's needs and business objectives are leveraging the potential of IoT & I4.0

OUR VISION FOR DIGITAL OPERATIONS IS BASED ON CLASSICAL OPTIMIZATION METHODS ENHANCED BY DIGITAL SOLUTIONS

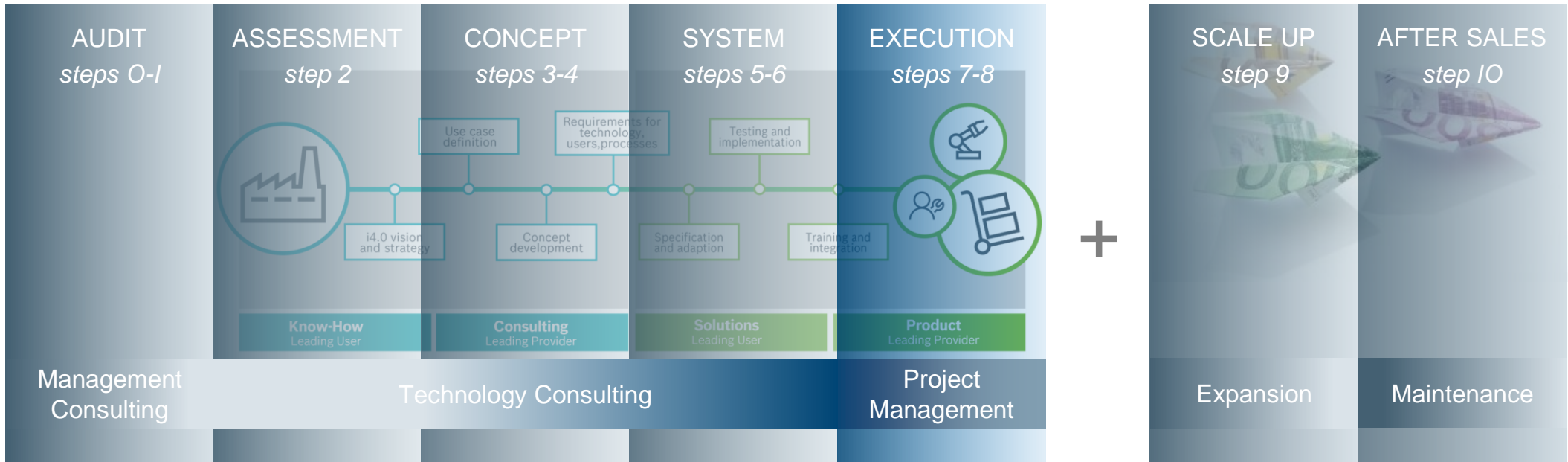


# OUR APPROACH



*from* BUSINESS CHALLENGES *to* DIGITAL SOLUTIONS

# PROJECT LIFECYCLE



OUR PROJECT APPROACH TO DIGITAL TRANSFORMATION IS MODULAR AND CAN BE ADAPTED BASED ON THE CURRENT MATURITY LEVEL OF EACH COMPANY

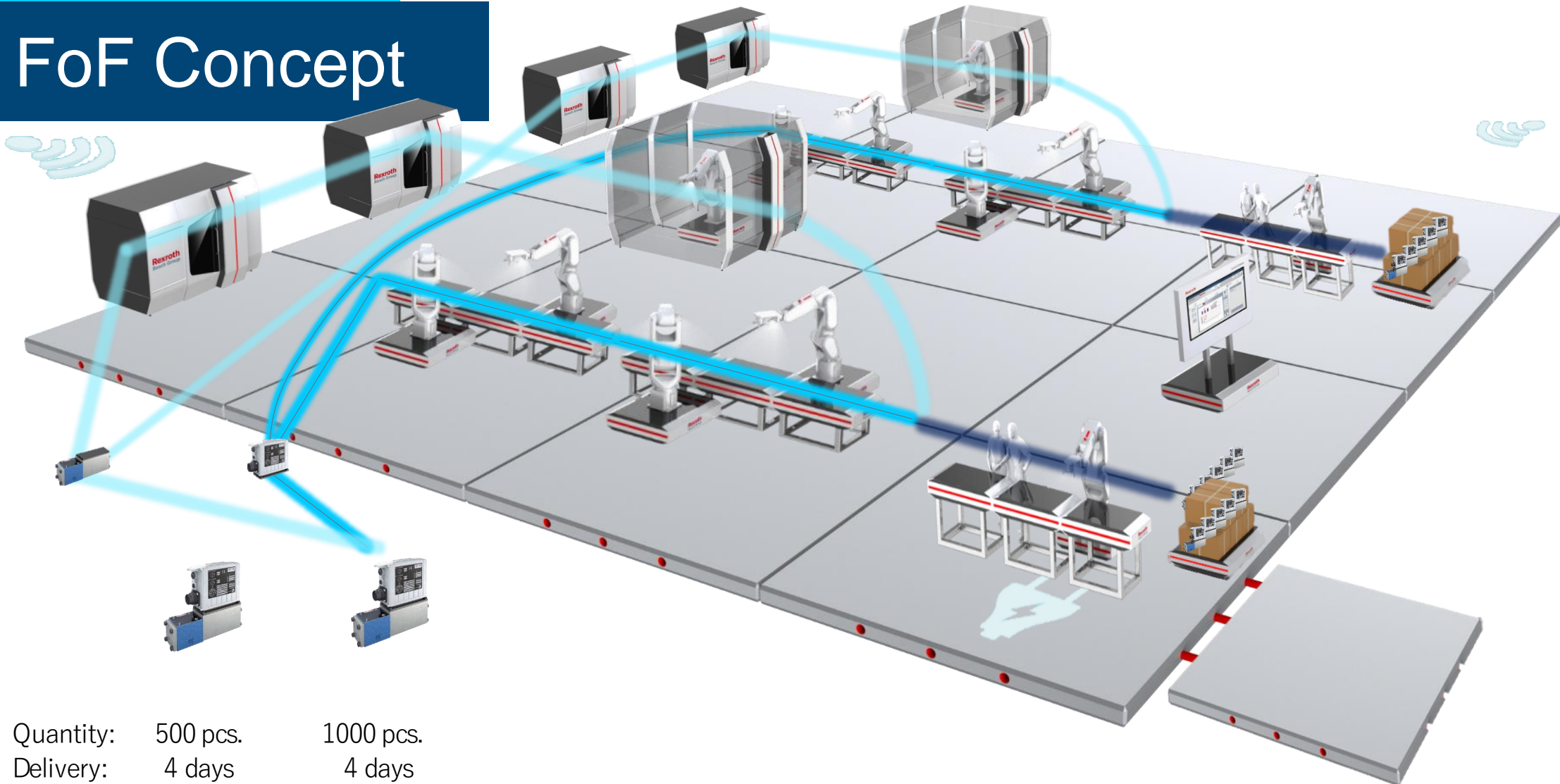


WHAT?

*Business value via solutions*



# FoF Concept



Quantity: 500 pcs.  
Delivery: 4 days

1000 pcs.  
4 days

DCEE/MKT-HU | 30/09/2021

Minden jog fenntartva, a rendelkezés, az értesítés, a reprodukálás, a feldolgozás, a továbbadás, és a jogvédelmi bejelentések joga is.

# 14.0 BROWNFIELD



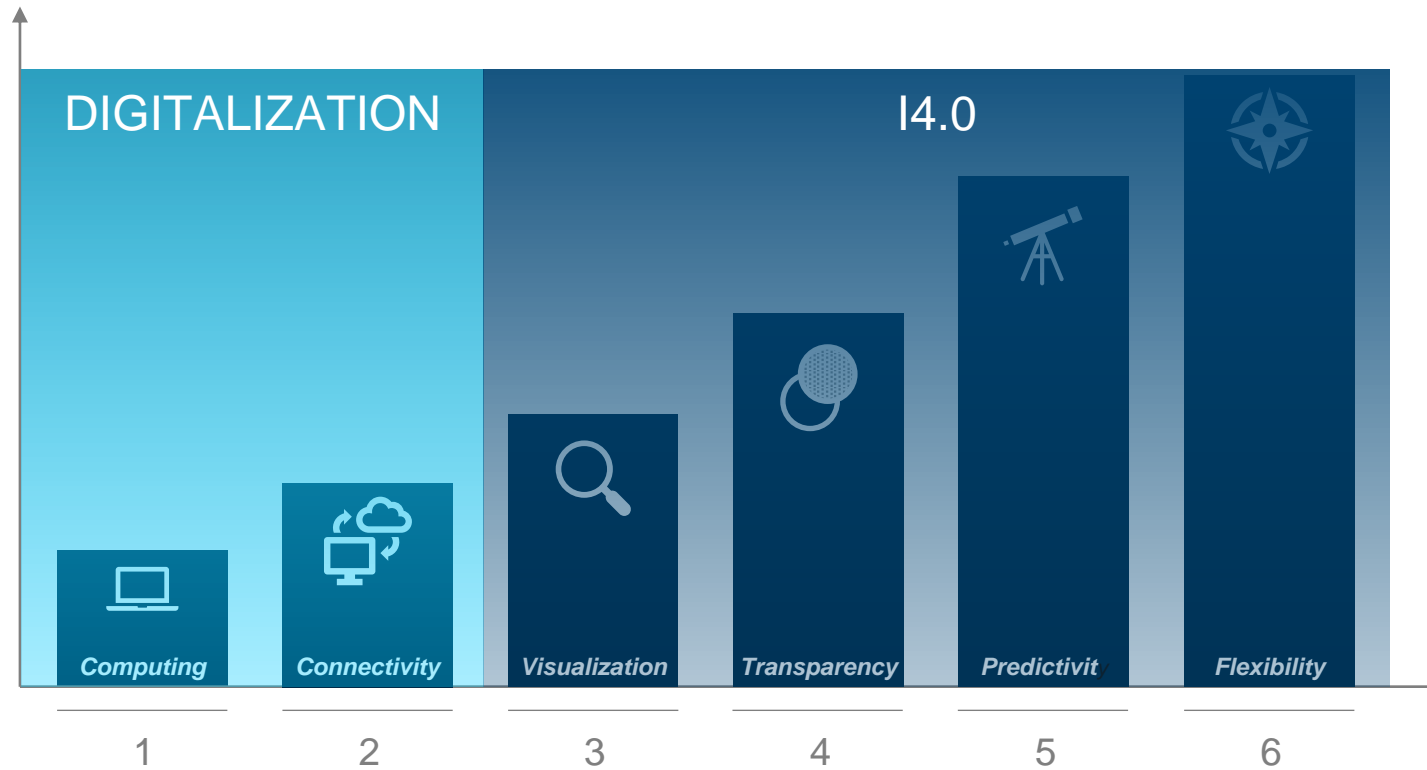
from retrofitting of machines from Robert Bosch built in the 19<sup>th</sup> century..



..to improving engineering of cutting edge technology.



# 14.0 MATURITY



# from SENSORS to CLOUD



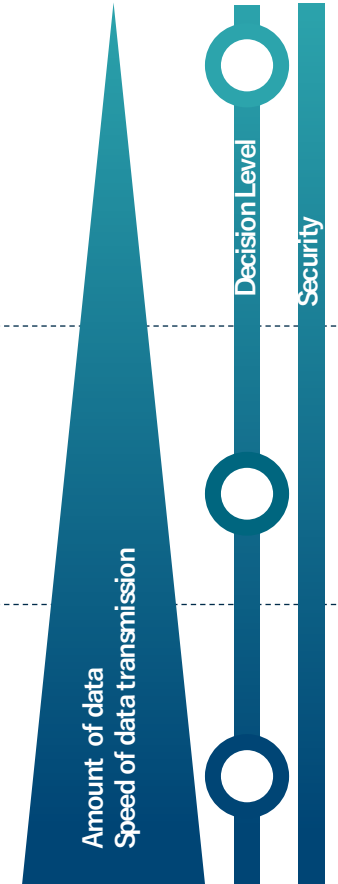
Cloud  
Enterprise IT



Edge



Device  
Line / Machine / Field Level



# IoT SYSTEM



Machine(s) & Sensors

*Input*

Data



IoT Gateway



Data



Cloud Systems, Data Bases

*Output*

*from SENSORS to CLOUD*

# SENSORS

*IoT sensors – data is key*



## BENEFITS:

- Less engineering – start under 5 minutes with mobile app
- Less components – up to 8 sensors in 1 device



# DATA COLLECTION

## Basic



### CONNECTIVITY KIT

- Data end points: **up to 19**
  - ✓ standard: 8A/3D
  - ✓ ext. „A”: +8A
  - ✓ ext. „B”: +5D
- Sampling rate:
  - ✓ 100ms (=10/sec=10Hz)
- Database & SW integration: closed system w dashboard

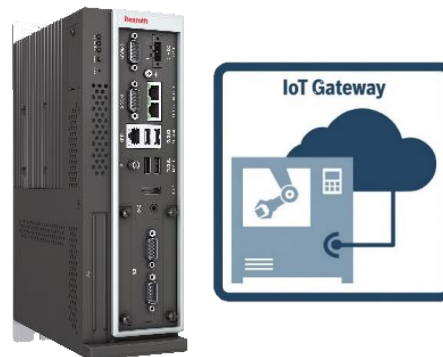
## Advanced



### IoT GATEWAY

- Data end points: **up to 2000**
  - ✓ Standard: 25
  - ✓ Advanced: 500
  - ✓ Performance: 2000 PR 43
- Sampling rate: (PR 21)
  - ✓ 100ms (=10/sec=10Hz)
- Database & SW integration: any database, BCI&other SW

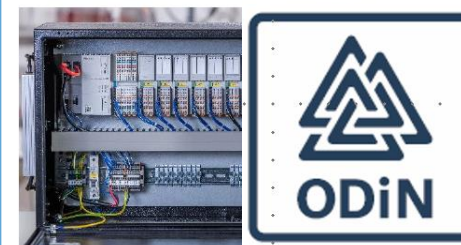
## High End



### IoT GATEWAY

- Data end points: up to 2000
  - ✓ Standard: 25
  - ✓ Advanced: 500
  - ✓ Performance: 2000 PR 43
- Sampling rate: (XM22)
  - ✓ 1ms (=1000/sec=1kHz)
- Database & SW integration: any database &SW

## ODiN



### IoT-GATEWAY\_DAQ-BOX\_AI-56

### ODiN (AI)

- Data end points: up to 2000 according to the IoT Gateway
- Sampling rate: (XM22)
  - ✓ 1ms (=1000/sec=1kHz)
- Database & SW integration: ODiN SW solution



# NEXEED IAS SW

## Condition Monitoring

Ongoing status recording for maximum transparency

## Process Monitoring

Reducing production errors and process deviations to a minimum

## Predictive Maintenance

Configurable rules, automatic messages and job assignments

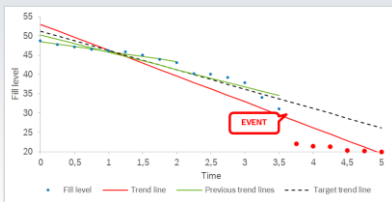
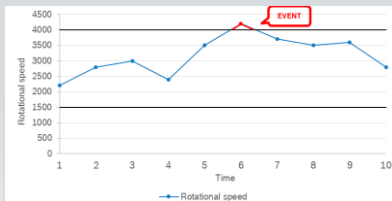
## Flexible i4.0 multipurpose tool

For customized applications in manufacturing facilities

# NEXEED IAS SW

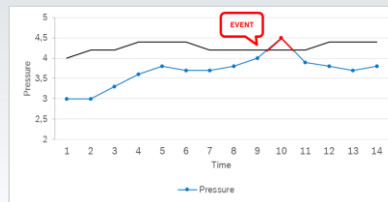
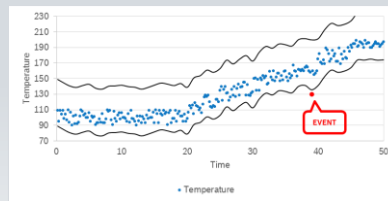
## Static

- ▶ Upper/lower limits
- ▶ Trend recognition; Sum of two measurements
- ▶ Static target with tolerance; Range



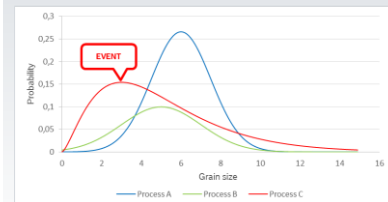
## Dynamic

- ▶ Dynamic limits
- ▶ Reference series as limit
- ▶ Jump detection



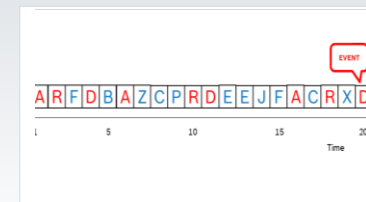
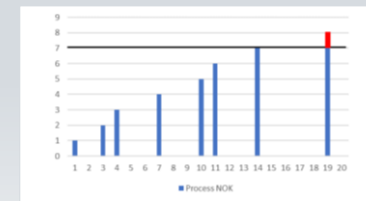
## Statistic

- ▶ Process capability index
- ▶ Normal distribution
- ▶ Nelson rules



## Counts

- ▶ Hit of events
- ▶ Hit of process results
- ▶ Event sequence detection

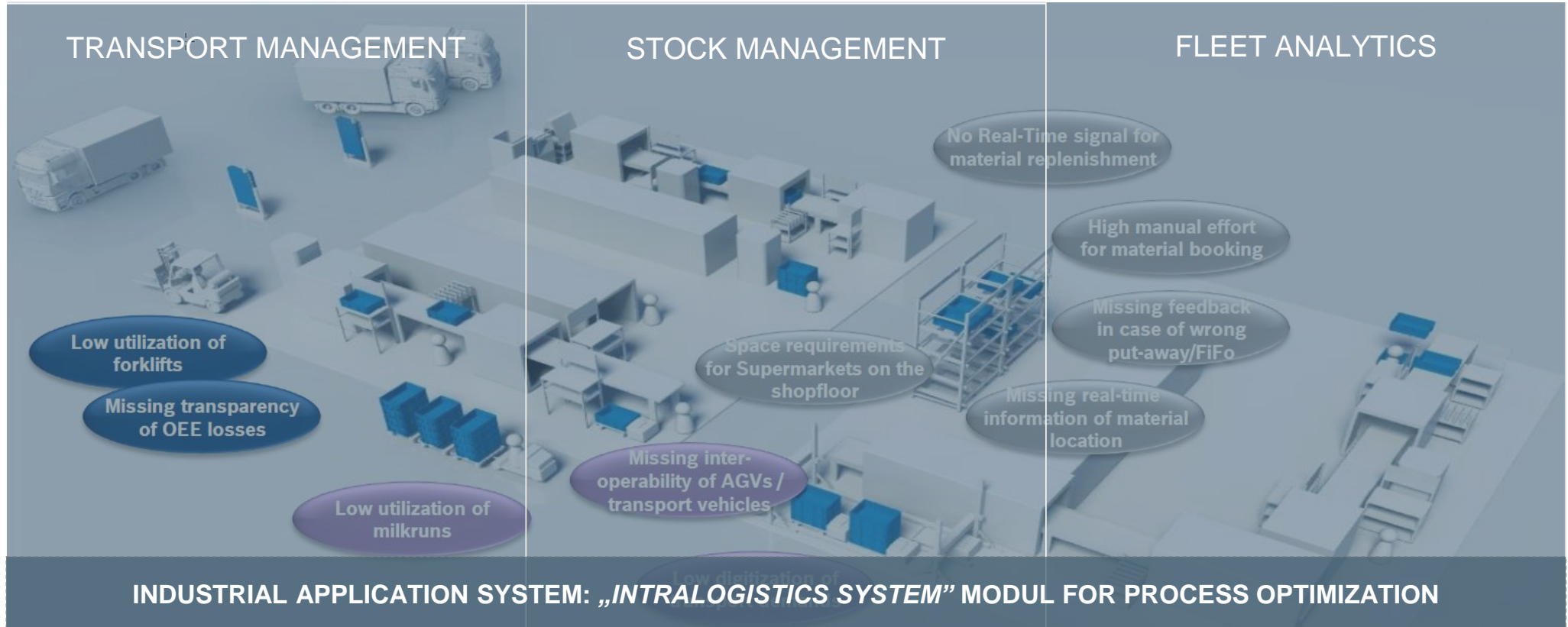


## Individual



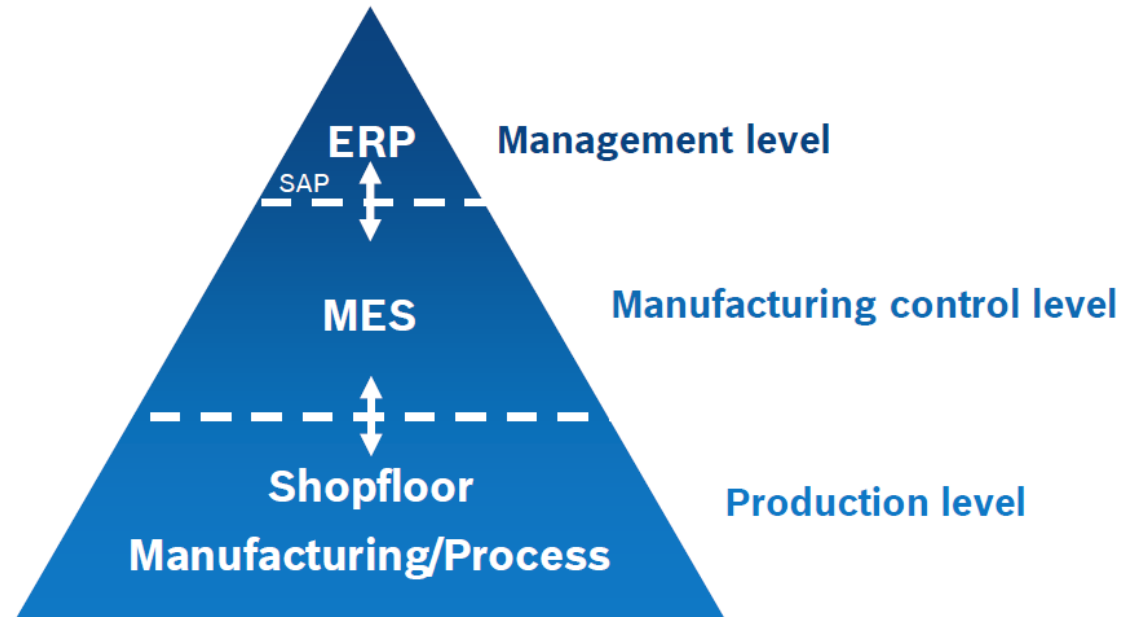
INDUSTRIAL APPLICATION SYSTEM: „PRODUCTION PERFORMANCE MANAGEMENT” MODUL FOR PREDICTIVE MAINTENANCE

# NEXEED IAS SW



# NEXEED IAS SW

- ▶ **M**anufacturing **E**xecution **S**ystem
- ▶ Informationssystem for the shopfloor
- ▶ Connection between planning (ERP) and production



INDUSTRIAL APPLICATION SYSTEM: „MANUFACTURING EXECUTION SYSTEM” MODUL TO INCREASE PRODUCTION EFFICIENCY



# ACTIVE COCKPIT

## PAST



- High manual effort for boards
- No interactive solutions
- No consistent action
- High surface requirements

## DIGITAL SOLUTION



- Connected with MES, ERP, DB
- Paperless communication
- Moderation-, escalation-, whiteboard
- Open system via app platform





# APAS & AGV



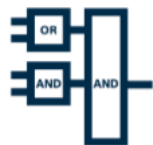
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# ctrlX



**ctrlX IOT**  
Integrated & Secure



**ctrlX PLC**  
IEC & non-IEC



**ctrlX WORKS**  
Runtime & Engineering



**ctrlX MOTION**  
Motion, Robotics & CNC



**ctrlX SAFETY**  
SafeLogic & SafeMotion



**ctrlX DRIVE**  
Drives & Motors



**ctrlX I/O**  
EtherCAT & 30 others



**ctrlX CORE**  
CPU & Performance



**ctrlX IPC**  
Box & Panel



**ctrlX HMI**  
Hard- & Software

OUR NEW AUTOMATION PLATFORM SURMOUNTS THE BOUNDARIES BETWEEN „MACHINE CONTROLS” *and the* „IoT WORLD”

# CONTACT US



**HSTec**  
HIGH SPEED TECHNIQUE

OUR PARTNERS ARE KEEN TO SUPPORT YOU IN CROATIA

*On the way to smart factory ...*