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5G enabled – Smart Factory @ stürmsfs

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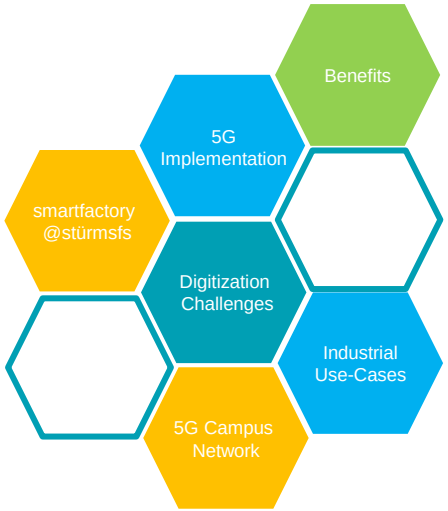
Time: 9AM PDT / 12PM EDT

intel network builders partner

Webinar Content –

what to expect from the next 45 minutes

- What is smartfactory@stürmsfs? Why did the company start their journey?
- Why did stürmsfs decide for a 5G Campus Network,
  as opposed to connecting their machines wired or through WiFi?
- How does such a 5G campus network typically look like and
  how is it particularly configured and implemented at stürmsfs?
- How difficult or easy would such an implementation be?
  How does the 5G project implementation journey look like?
- What does stürmsfs use the 5G network for? Now and in future?
- Which use-cases do we know from other industrial clients?
  What do they intend to use 5G campus networks for?



stürmsfs Digitization Journey

- One of the largest steel wholesalers in CH
- Differentiating and growing through services, in particular pre-manufacturing (sawing, laser-cutting) of customized steel parts and steel elements for low-volume / high-mix
- Speed is key: need to know about available machine capacity, align it to customer demand rapidly and shorten lead times

→ Create visibility of key machine parameters at any point in time

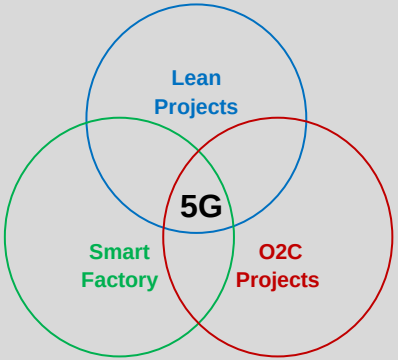
→ Provide constant data flow from machinery into SAP planning system

→ Explore most modern, reliably connectivity technology (private 5G)

→ Share experience with others in an Open Lab format

stürmsfs Vision and Motivation

- Learn what the factory is doing:
  Status (OEE; Machine efficiency)
- Data for order calculation



- Paperless logistics – tracking and loading
- Predictive maintenance to optimize utilizations
- Order to Cash optimizations:
  from web-shop order to execution
- Just in time production

5G connectivity technology
→ is resolving production process issues (EMC, reflections)
and
→ has become key enabler for innovations (Open Lab)

5G Campus Networks – a future-proof alternative

Cabling:

- Limitations in flexibility

Wi-Fi:

- Limitations in performance

5G Campus Network

flexible installation
reliable connectivity
superior bandwidth
low latency

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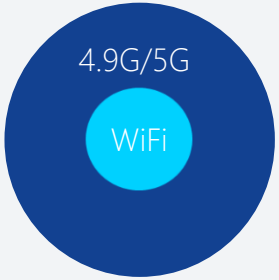
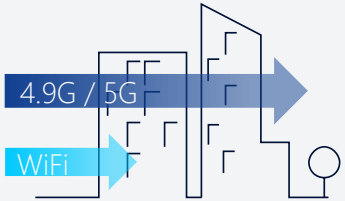
5G Campus Networks – a future-proof alternative

Wide and deep coverage

4-100x coverage

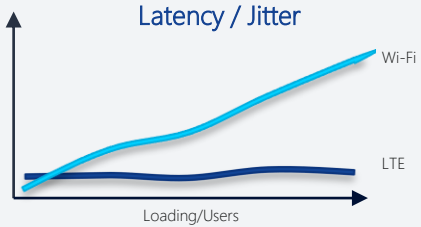


>3 extra walls of penetration

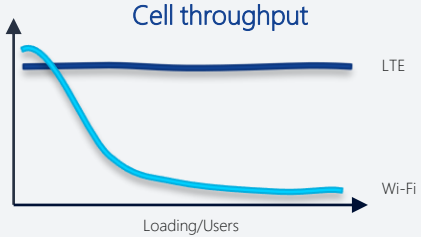


Predictable performance

Stable <15ms latency



25x multi-user capacity



Military grade security

HACKED

Wi-Fi - WPA2/3

4.9G/5G
SIM authentication
E2E encryption

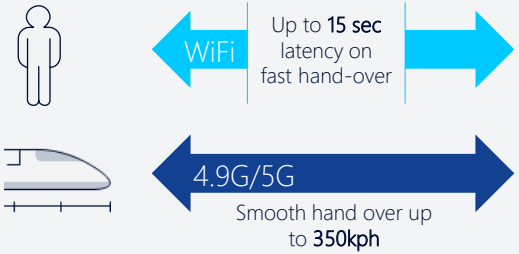
One network for all apps

Wi-Fi 5/6
- Does not include IIoT LP capabilities

LTE integrates LPWAN
- Narrow band, low power applications on same radio

LTE-M NB-IoT

High speed mobility



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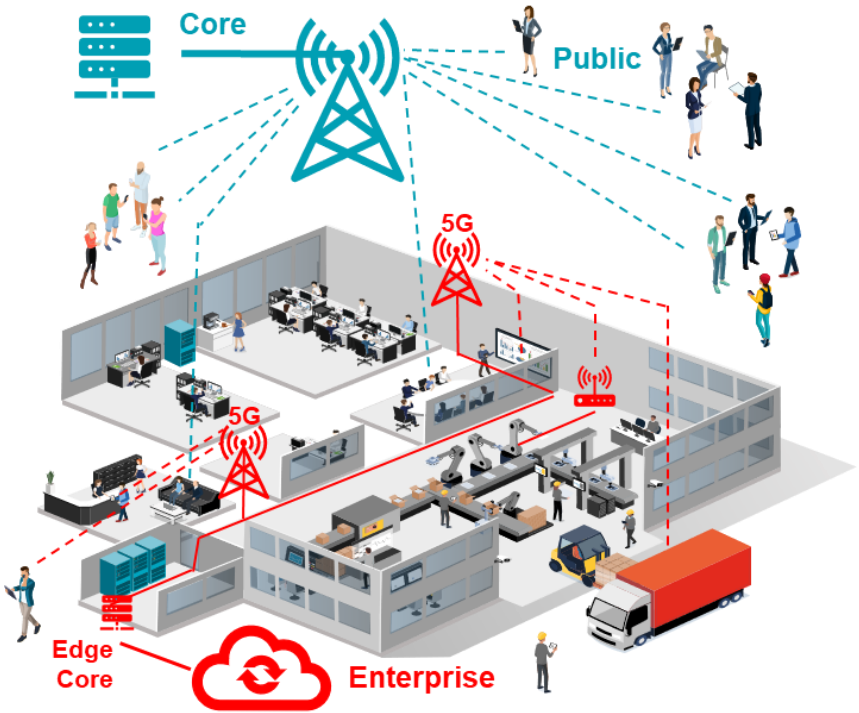
In a nutshell –

Where a Private 5G Campus Network makes most sense

Employees mobile services	Office & Site services apps	Business critical applications	Mission critical applications
			
Public CSP services in enterprise site	Enterprise controlled networks	Enterprise controlled networks	
IT requirements IT responsibility	IT requirements IT responsibility	Operation Technologies (OT) requirements Combined OT/IT responsibility	
4G/5G	LAN & Wi-Fi	Critical operation connectivity technologies Industrial-grade LAN + **private 4.9G/LTE & 5G**	

5G Campus Networks – the concept

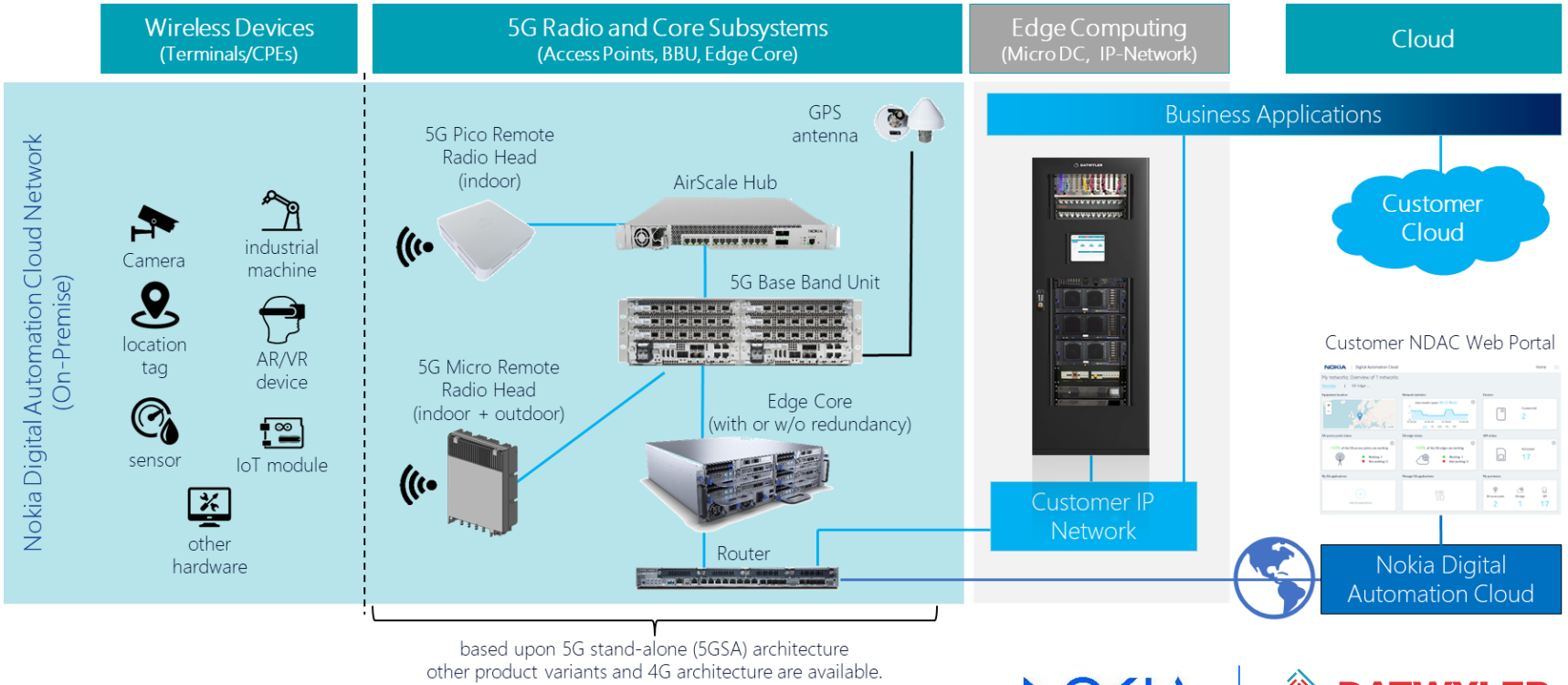


Completely independent 5G network

- RAN, Edge Core and Router dedicated to Enterprise Traffic, only
- SIM controlled access for highest security: No access for public users
- Secure processing of company data within the enterprise network, only
- All benefits in terms of security, low-latency and high-bandwidth
- Connection and control of machines, sensors and various devices

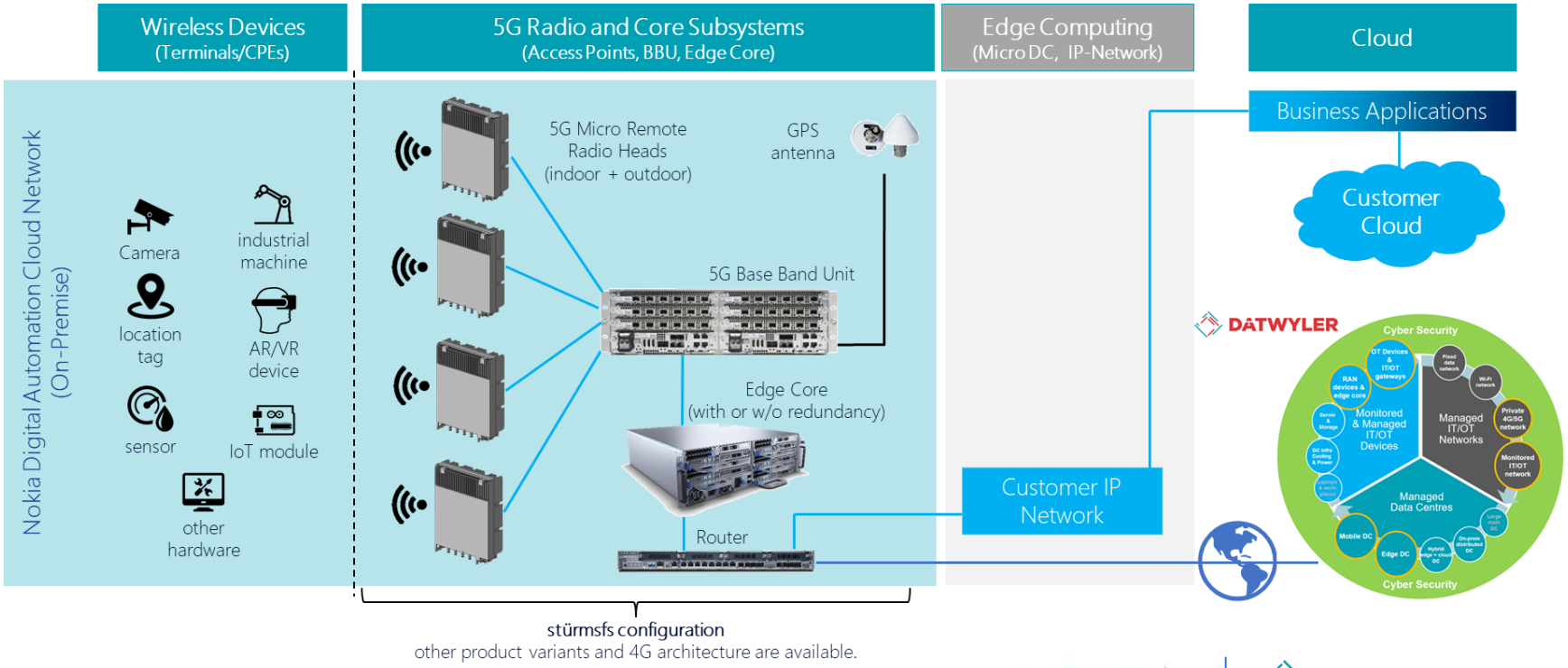
Private 5G Campus Networks – the concept

Nokia Digital Automation Cloud (NDAC)



5G Campus Network Implementation @ stürmsfs

Nokia Digital Automation Cloud NDAC



stürmsfs configuration

other product variants and 4G architecture are available.

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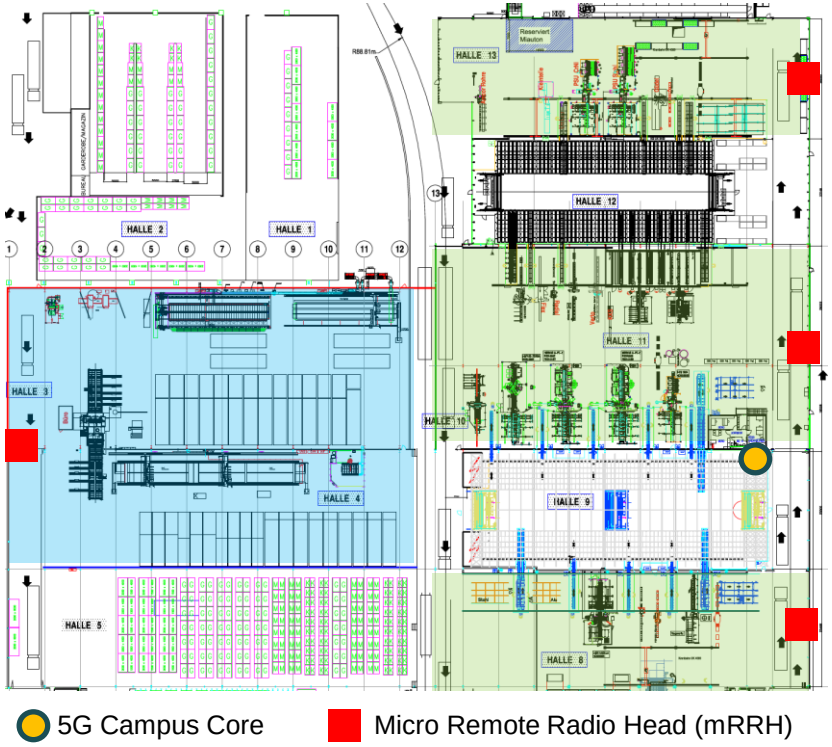
5G Campus Network Implementation @ stürmsfs

Realization in two phases

- **2022: Pilot project** (blue)
  covering an area of 60x95m with
  one mRRH and two external antennas
- **2023: Extension** of the system
  to connect 3 more halls (green)
  with one mRRH each with integrated
  antenna system

- **Project Summary:**
  - Total indoor coverage of all halls with
    manufacturing activity (~15.000 m²)
  - Four Micro Remote Radio Heads
    instead of >60 WiFi access points

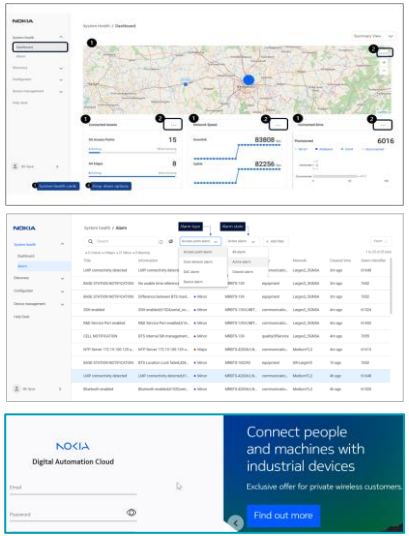


5G Campus Network Implementation @ stürmsfs

Testing Wireless Devices

Radio and Core Subsystems
(Access Points, BBU, Edge Core)

Nokia Digital Automation Cloud



5G Project Implementation Journey

0 Project Planning

- Use Case analysis
- Technology Decision
- Budgeting
- Proof of Concept
- Reference visits

1 Network Planning & Site Survey

- Use case scenarios
- Spectrum & licenses
- Deployment models
- Coverage & capacity dimensioning
- Security concept

2 Network Deployment

- Pre-configuration & commissioning
- Cabling & site preparation
- Hardware delivery
- On-site deployment
- Verification & acceptance

3 Network & Use Case Integration

- Use case & IP integration
- Health & security check
- Network performance optimization
- Technical consultancy
- Trainings & certification

4 Network Operation

- Global NW monitoring
- Self-service web portal
- Hardware & software updates
- Level 1 and 2 support
- OSS & API access

Project & Delivery Management

Use Case Blueprints & Standardization

Security

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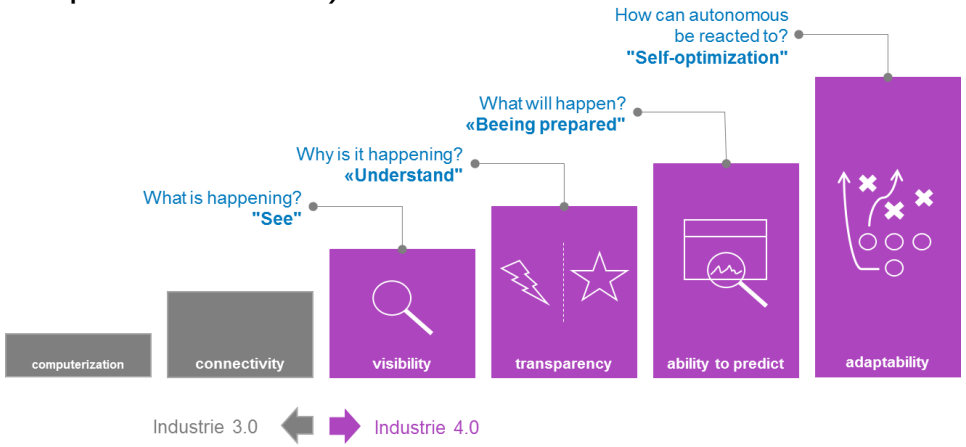
5G Campus Network Use-Cases @ stürmsfs

- **Principle:** Whenever possible, asset data is obtained via the 5G network.
- **Step 1:** Collect data and present it on a dashboard. Derive measures to increase machine uptime.
- **Step 2:** Link data with order data in SAP (pre- and post-calculation).

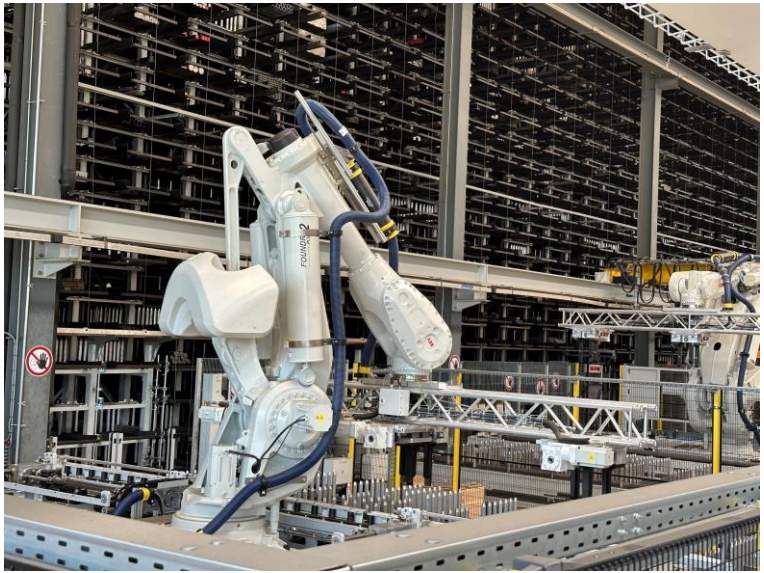


Why 5G Campus Network?
Create an innovative environment for future ideas and use-cases thanks to the most advanced communication technology currently available (5G).

5G Campus Network Use-Cases @ stürmsfs

Status at Stürmsfs:

- Factory Goldach is up and running
- Connecting all the machines in Hall 3 & 4
- Connect the automated sawing centers in future
- Integrate logistics and business processes
- Enable further use cases in the next 1- 2 years
  give customer – capacity utilization
  (flexible lead time optimization – O2C)



5G Campus Network Use-Cases in the industry

SAFETY / SECURITY

- Push-to-Talk for Safety / Alarms
- Video-Fencing of dangerous areas
- Helmet and Vest detection / supervision
- Digital Assistance / Support
- Digital Trainings

data and AI supported control

QUALITY

- Digital Routings and Manuals
- Pick-by-Video or Pick-by-Voice
- Automated failure detection
- Batch Management

PRODUCTIVITY / EFFICIENCY

- Localisation of equipment & material
- Traffic and walk-way optimization
- Predictive / preventive maintenance of tools and machinery
- Demand based material planning and logistics

Daphne

Christian???

@Daphne: Could you come up with an Intel closing page somehow consistent with the cover slide?

Thank you

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