

# HOLO INDUSTRY

INDUSTRY 4.0  
MIXED REALITY EXPERT

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OUR PARTNERS:



Microsoft

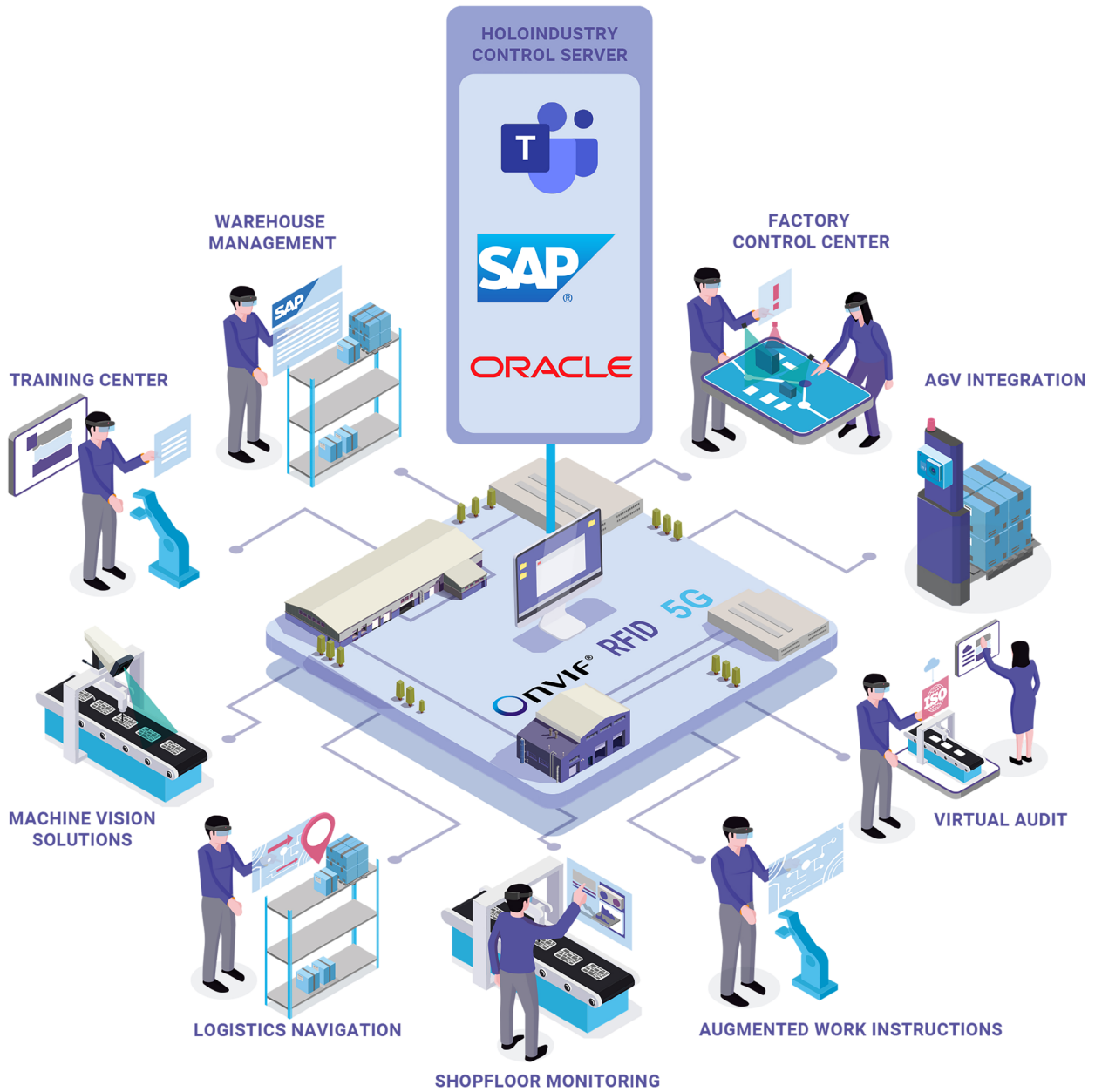


vodafone

VUZIX

BASLER

# OUR CONCEPT



As a central element of the solution, a virtual server located in the customer's infrastructure serves the communication needs between the various production systems and the applications, and is responsible for ensuring the suitable business logics. If required, each modular program can be accessed remotely via a secure VPN channel using appropriate access rules.

# OUR PRODUCTS



## VIRTUAL AUDIT



### MANAGING CUSTOMER VISITS AND AUDITS IN THE DIGITAL SPACE

RESULTS:

1. The factory may also be visited remotely during the entry ban due to the COVID-19 pandemic.
2. Conduct the necessary audits with 21st century tools, efficiently, documented.



## TRAINING CENTER, WORK INSTRUCTIONS



### TRAINING SUPPORT & TRAINING OPERATORS

RESULTS:

- 1: Shorter overall training period, improved assembly efficiency
- 2: Less engineering/training resource needed



## SHOPFLOOR MONITORING



### DISPLAYING PROCESSES ONLINE

RESULTS:

- 1: Tablets and computers used for displaying data become unnecessary
- 2: An increase in efficiency due to remote overview and continuous control



## FACTORY CONTROL CENTER



### CONTROLLING THE ENTIRE FACTORY

RESULTS:

- 1: Mapping, managing and preventing quality assurance and security incidents
- 2: A complete overview and control of the entire factory from one place



## AGV INTEGRATION

### AUTOMATICALLY GUIDED VEHICLES

RESULTS:

- 1: Building a secondary security system using 3D cameras
- 2: Perform simulations, display statistics and processes in the HoloLens user interface

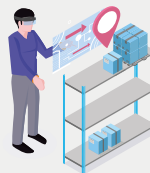


## WAREHOUSE MANAGEMENT

### SAP INTEGRATED, USING REMOTE FUNCTION CALLS

RESULTS:

- 1: An increase in process speed
- 2: Fewer ERP accounting errors

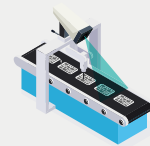


## LOGISTICS NAVIGATION

### PERFORMING KITTING PROCESSES IN AUGMENTED REALITY

RESULTS:

- 1: An increase in process speed
- 2: Less time needed to train new operators



## MACHINE VISION SOLUTIONS

### BOM EXAMINATION, CPU INSPECTION, BARCODE SCANNING

RESULTS:

- 1: Faster scanning processes
- 2: Fewer faulty motherboards used



## VIRTUAL AUDIT



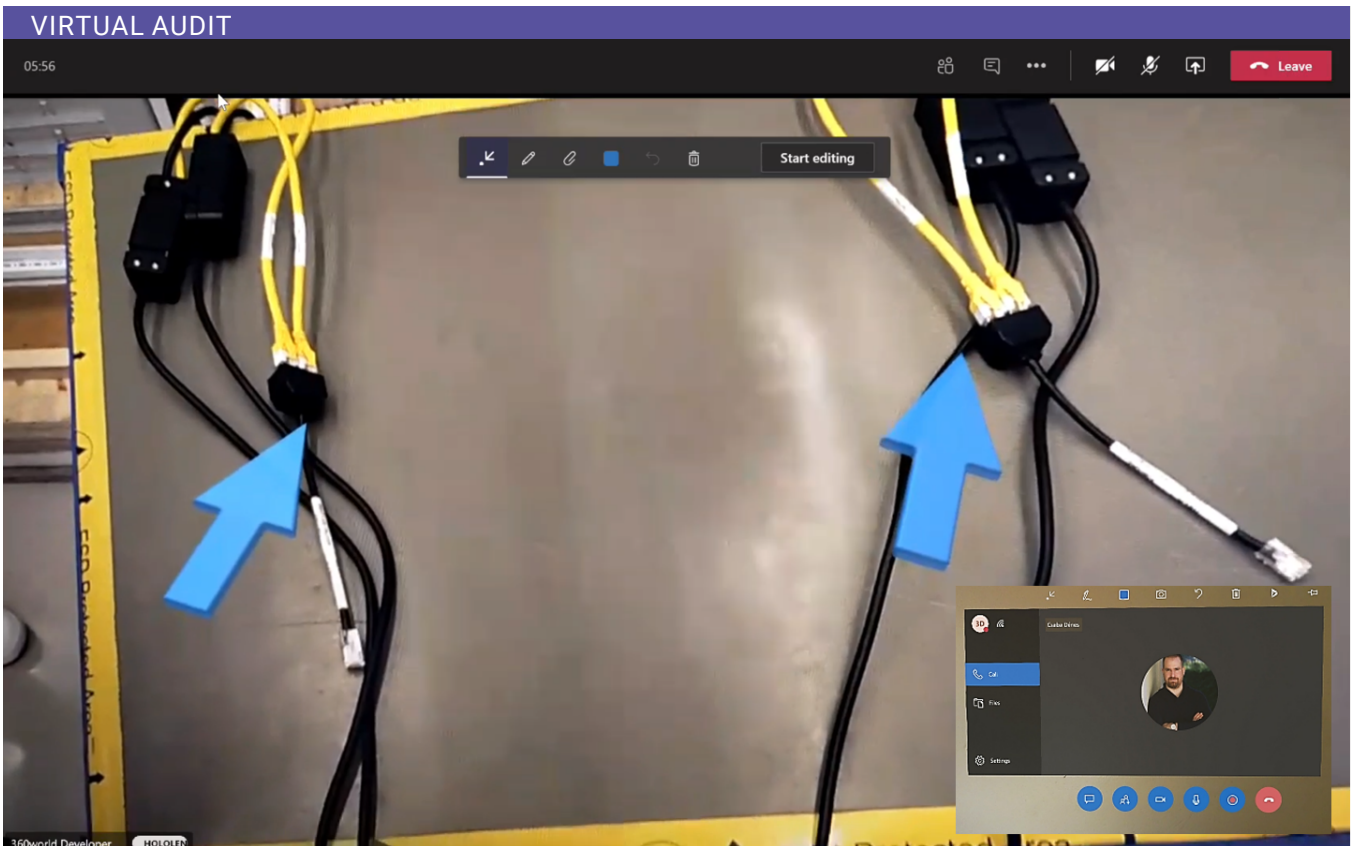
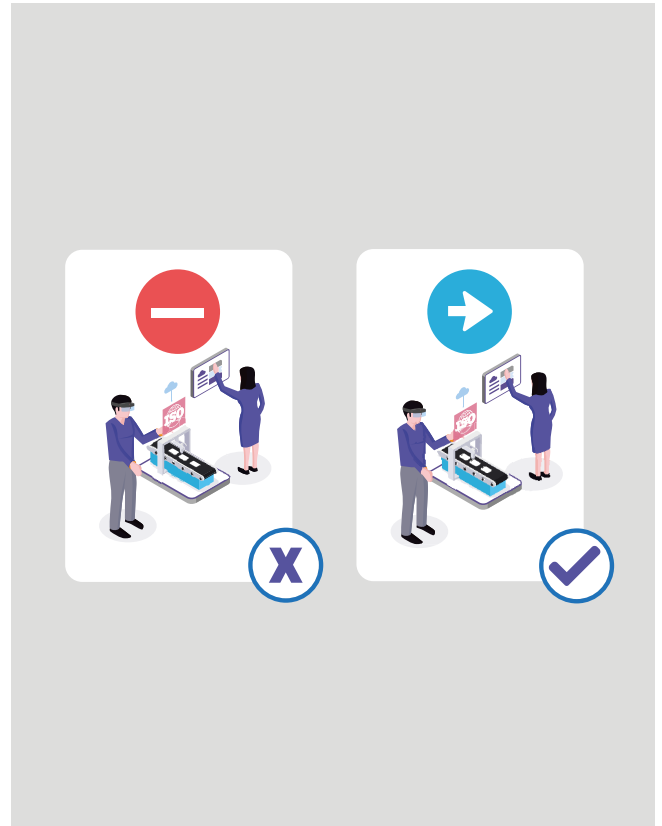
## MANAGING CUSTOMER VISITS AND AUDITS IN THE DIGITAL SPACE

### CHALLENGES:

1. In the situation caused by the COVID-19 pandemic, the factories were forced to introduce entry restrictions and bans, which makes it difficult or impossible for customers and partners to enter the site.
2. Supplier and official audits have become difficult due to the pandemic, while increasing professional standards must be met during audits.

### RESULTS:

1. The factory may be visited remotely by potential and existing customers during the COVID-19 entry ban, providing additional, augmented reality information during the call.
2. Carry out the necessary audits on digital channels, with recording and interactive communication options.





## AGV INTEGRATION

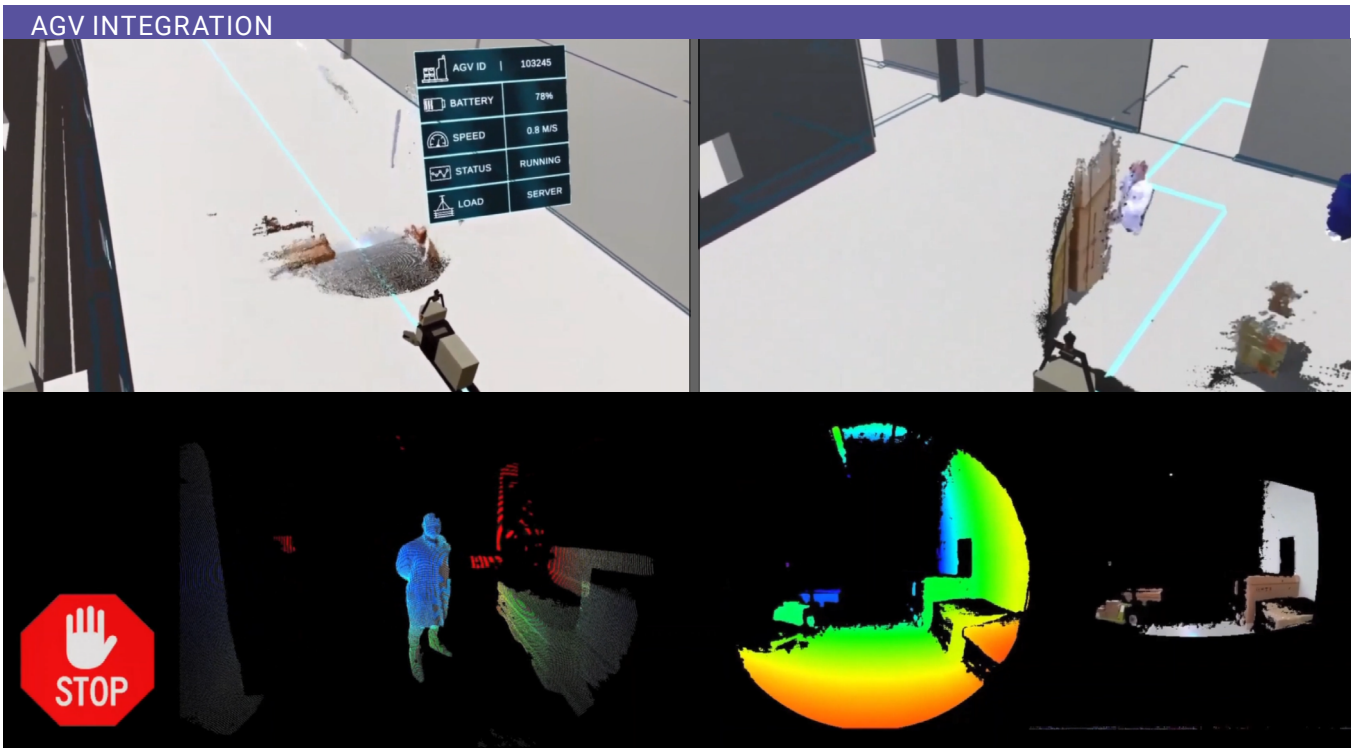
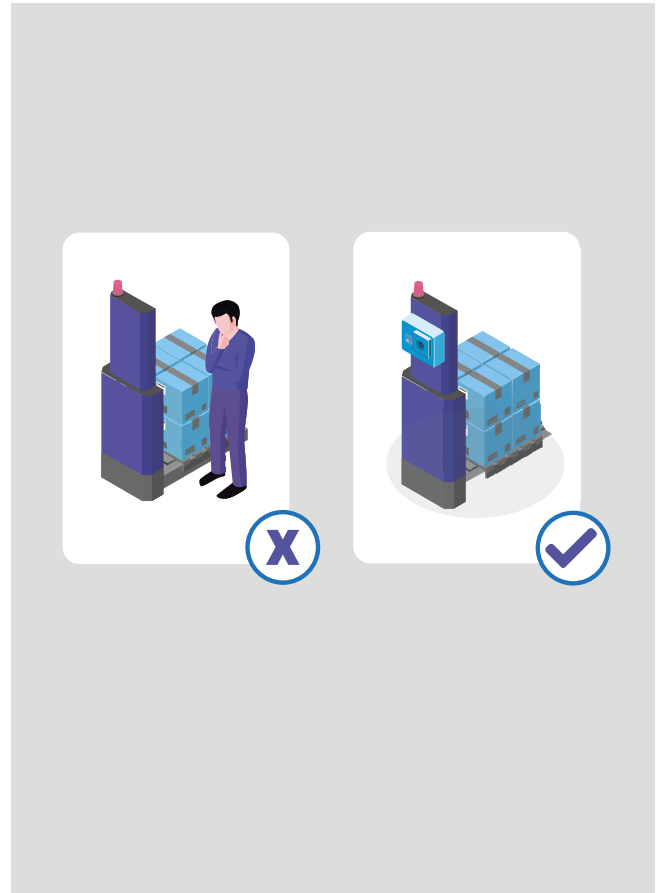
## OPERATION OF AUTOMATICALLY GUIDED VEHICLES IN AUGMENTED REALITY

### CHALLENGES:

1. Most of the AGVs currently in operation are not able to change the route previously assigned to them, which can cause interruptions in the continuous movement of materials and delays in the performance of the required work.
2. The challenge for vehicles, even with the highest safety certificates, is to deal with the rapidly changing environmental conditions of factories and to ensure a maximum level of EHS compliance.

### RESULTS:

1. With the help of live BIM (Building Information Modeling) data, we can improve the usability and utilization of AGVs and their efficient integration into production processes.
2. With the introduction of a secondary safety system, the current operation can be extended to areas where the devices have not been deployed so far due to the high risk of expected collisions.





## TRAINING CENTER



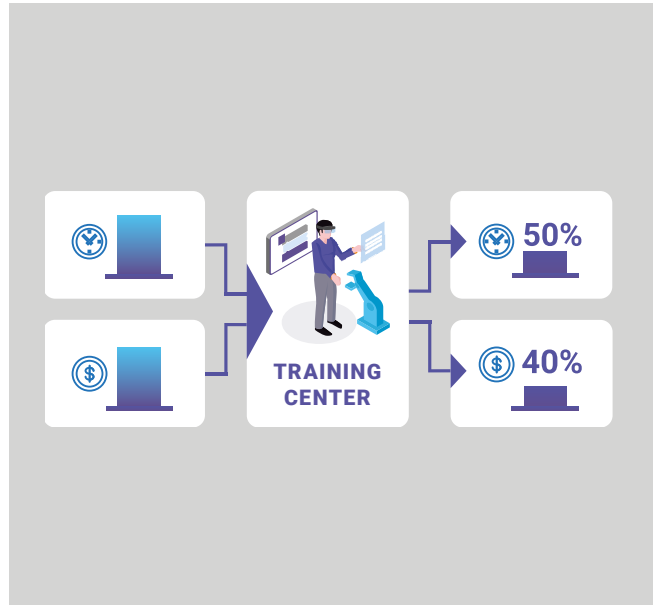
## TRAINING SUPPORT AND TRAINING OPERATORS

### CHALLENGES:

1. Companies have to calculate with long training periods and high staff turnover.
2. There is a limited availability of trained personnel and their expertise should be used primarily in production.

### RESULTS:

- 1: The entire training period decreased by 50% due to deeper involvement.
- 2: The amount of training/engineer resources necessary decreased by 20% due to the more efficient flow of information.



## TRAINING CENTER





## AUGMENTED WORK INSTRUCTIONS

## WORKING IN MIXED REALITY

### CHALLENGES:

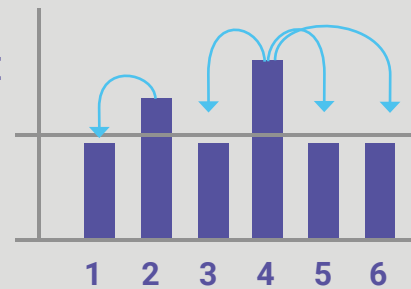
1. Preparing and updating work instructions for continuously changing products uses a significant amount of resources.
2. Assembling different versions of various products requires a high level of concentration and carries an increased risk of errors.

### RESULTS:

- 1: Assembly times improved by 30% due to continuous feedback.
- 2: Previously hidden Kaizen proposals are discovered due to closer cooperation and the emergence of bottlenecks.

### TAKT TIME

### OPER. NO.



## CABLING GUIDE





## SHOPFLOOR MONITORING



**COVID-19 PROOF**

**DISPLAYING PROCESSES ONLINE**

### CHALLENGES:

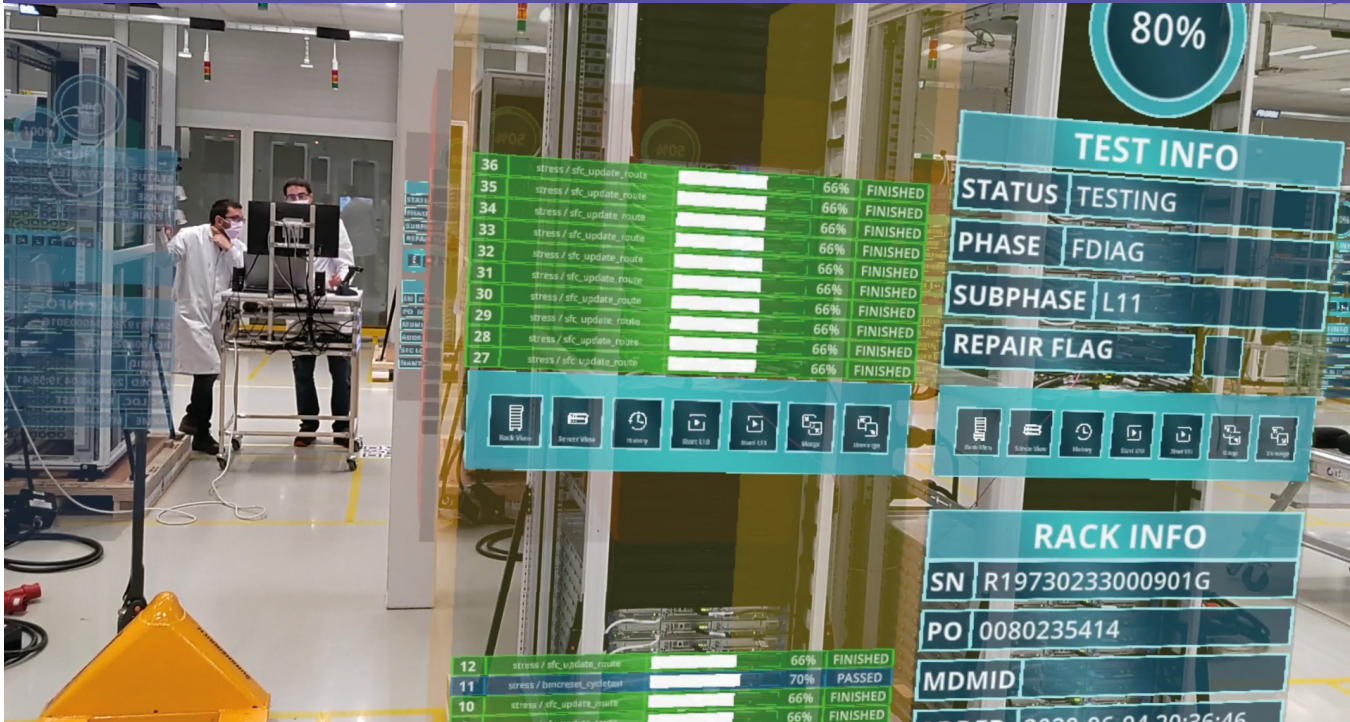
1. To display and check the current status of production processes, a complex IT network and a number of associated display devices are needed.
2. Information available on Shopfloor is not always accessible remotely, e. g. in case there is a need for management overview.

### RESULTS:

- 1: All tablets and computers used to display information become unnecessary, Andon functions become accessible from anywhere.
- 2: An increase in efficiency due to remote overview and continuous control.



## SHOPFLOOR MONITORING







## FACTORY CONTROL CENTER



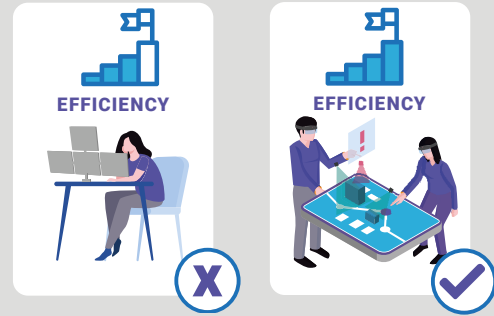
## CONTROLLING THE ENTIRE FACTORY UNIT FROM ONE PLACE

### CHALLENGES:

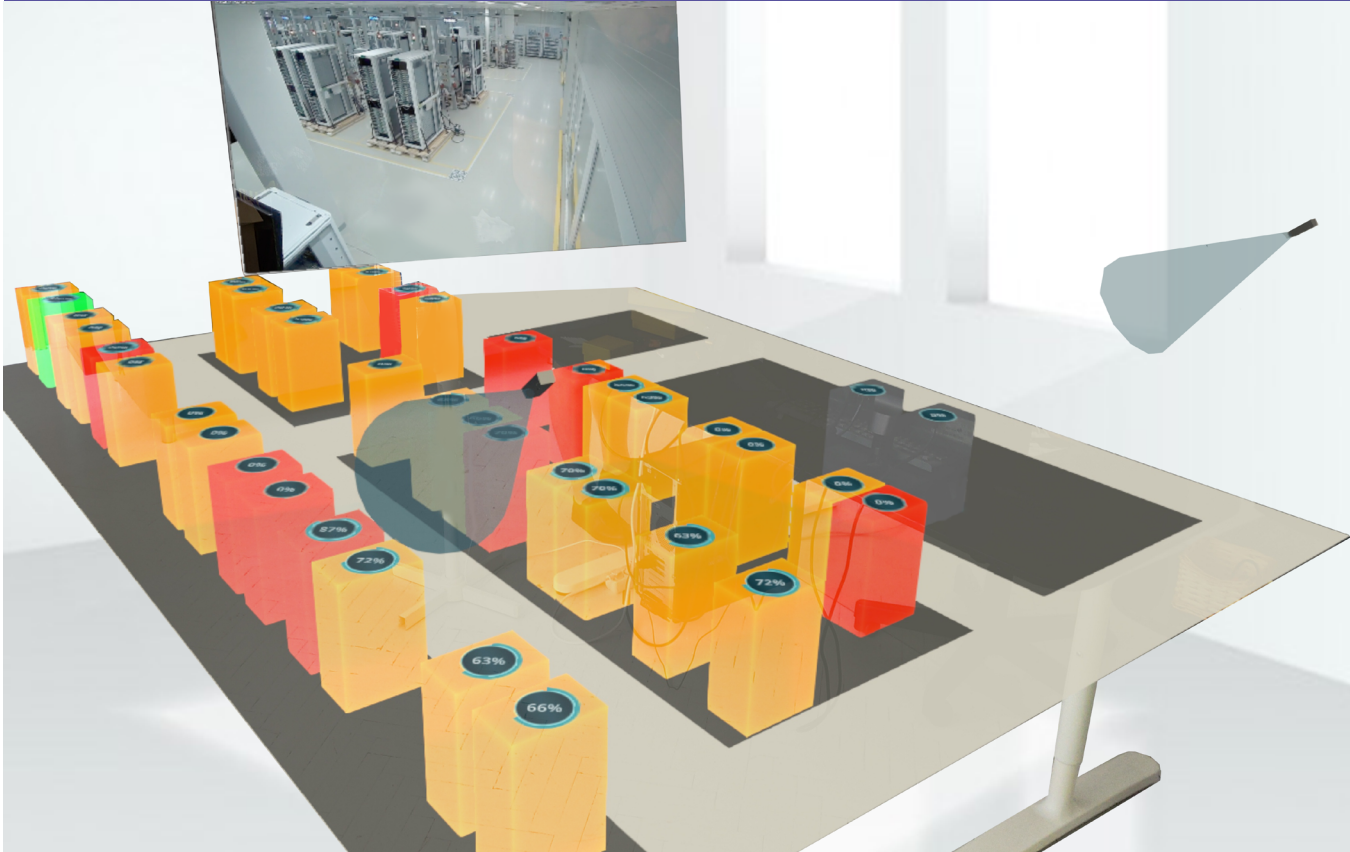
1. In case of large factories, the overview of the entire production/logistics area from a central place can not be achieved, or only with great difficulty.
2. The various business and security functions are not available on one platform, they require the use of separate systems and personnel.

### RESULTS:

- 1: Mapping, managing and preventing quality assurance and security incidents.
- 2: A complete overview and control of the entire factory from a single place of the client's choice, which can be flexibly changed in real time based on the client's needs.



## FACTORY CONTROL CENTER





## WAREHOUSE MANAGEMENT

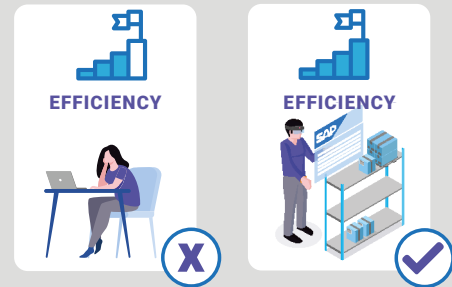
## INTEGRATED INTO SAP USING REMOTE FUNCTION CALLS

### CHALLENGES:

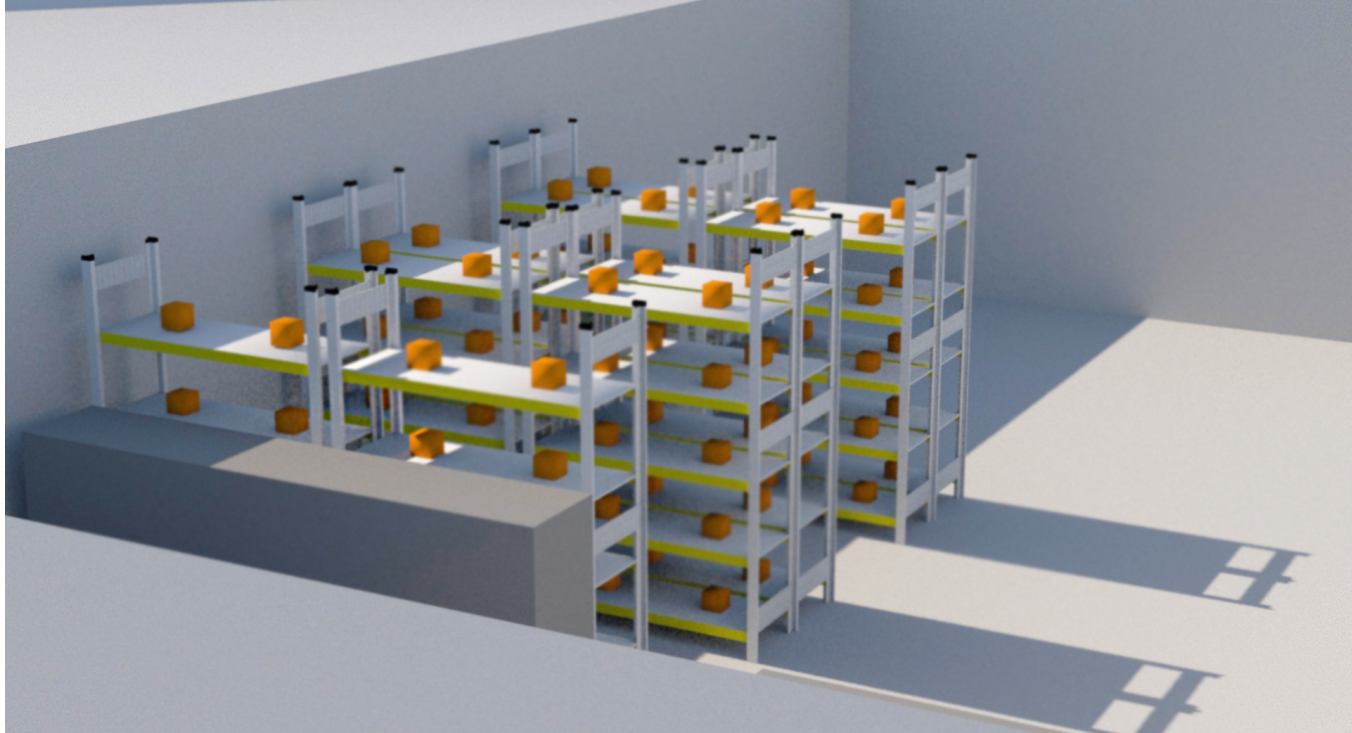
1. When performing kitting tasks, operators are forced to move between the warehouse and the computers continuously.
2. The separation of the steps of the accounting process in space and time greatly increases the risk of errors and makes a certain degree of duplication unavoidable.

### RESULTS:

- 1: A 20% increase in process speed due to the elimination of unnecessary steps.
- 2: A 50% decrease in ERP accounting errors with the help of operations executed Just In Time.



## WAREHOUSE MANAGEMENT





## LOGISTICS NAVIGATION

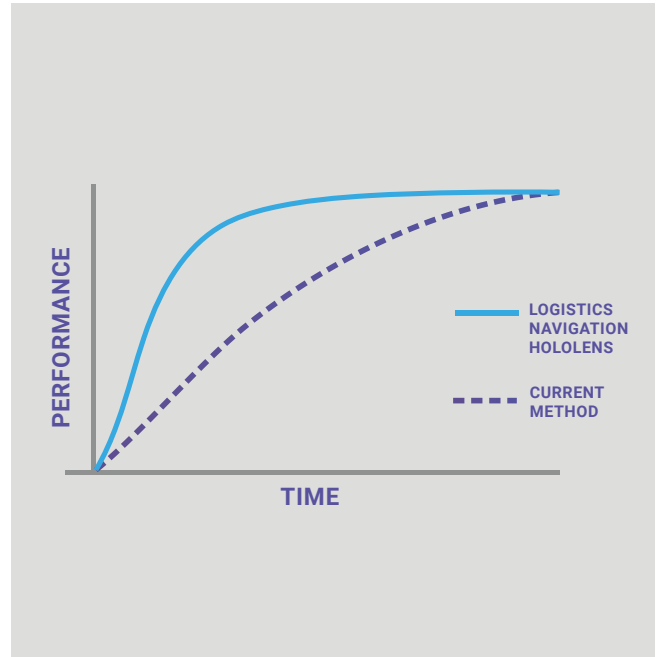
## PERFORMING KITTING TASKS IN AUGMENTED REALITY

### CHALLENGES:

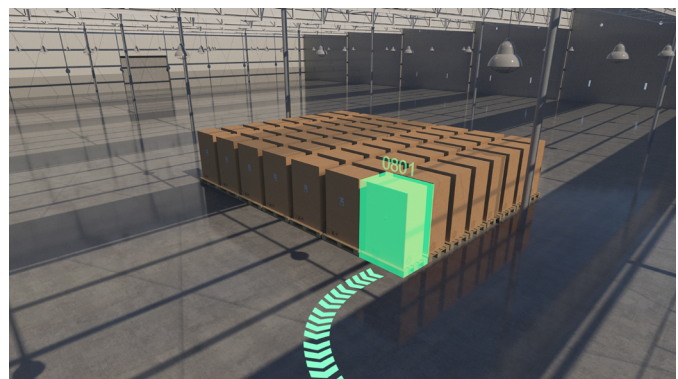
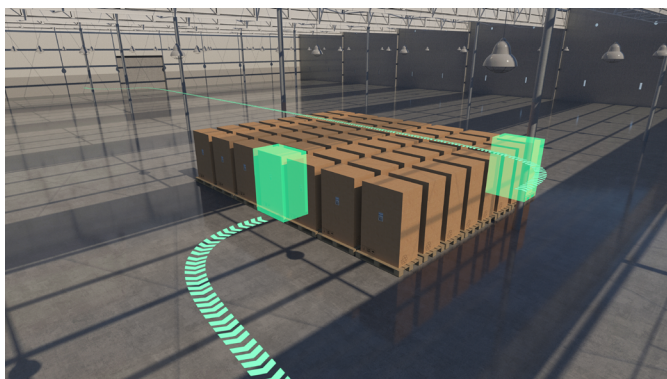
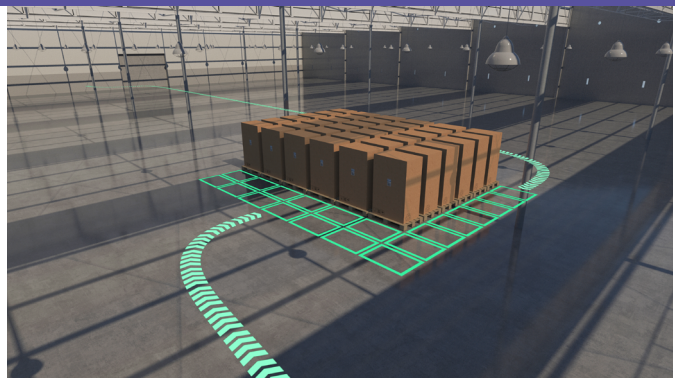
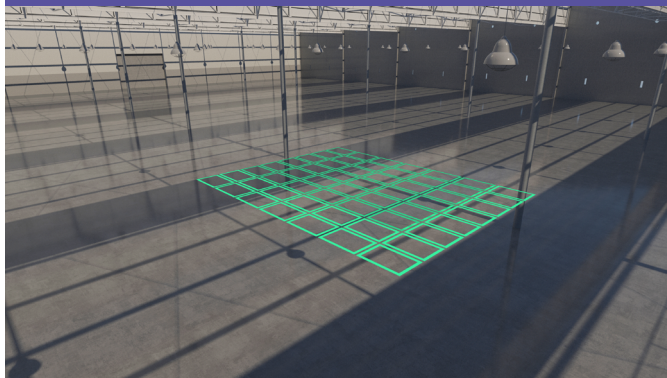
1. In the case of complex, large warehouse areas, and/or if there is a lack of suitable pathways, logistics tasks are not executed optimally.
2. New operators need a long time until they can perform their tasks efficiently without senior support.

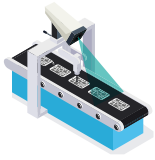
### RESULTS:

- 1: A 25% increase in process speed with the support of precise instructions.
- 2: A significant decrease of the time needed to train new operators due to the real time availability of the most important information.



## LOGISTICS NAVIGATION





## MACHINE VISION SOLUTIONS

## BOM EXAMINATION, CPU INSPECTION, BARCODE SCANNING

### CHALLENGES:

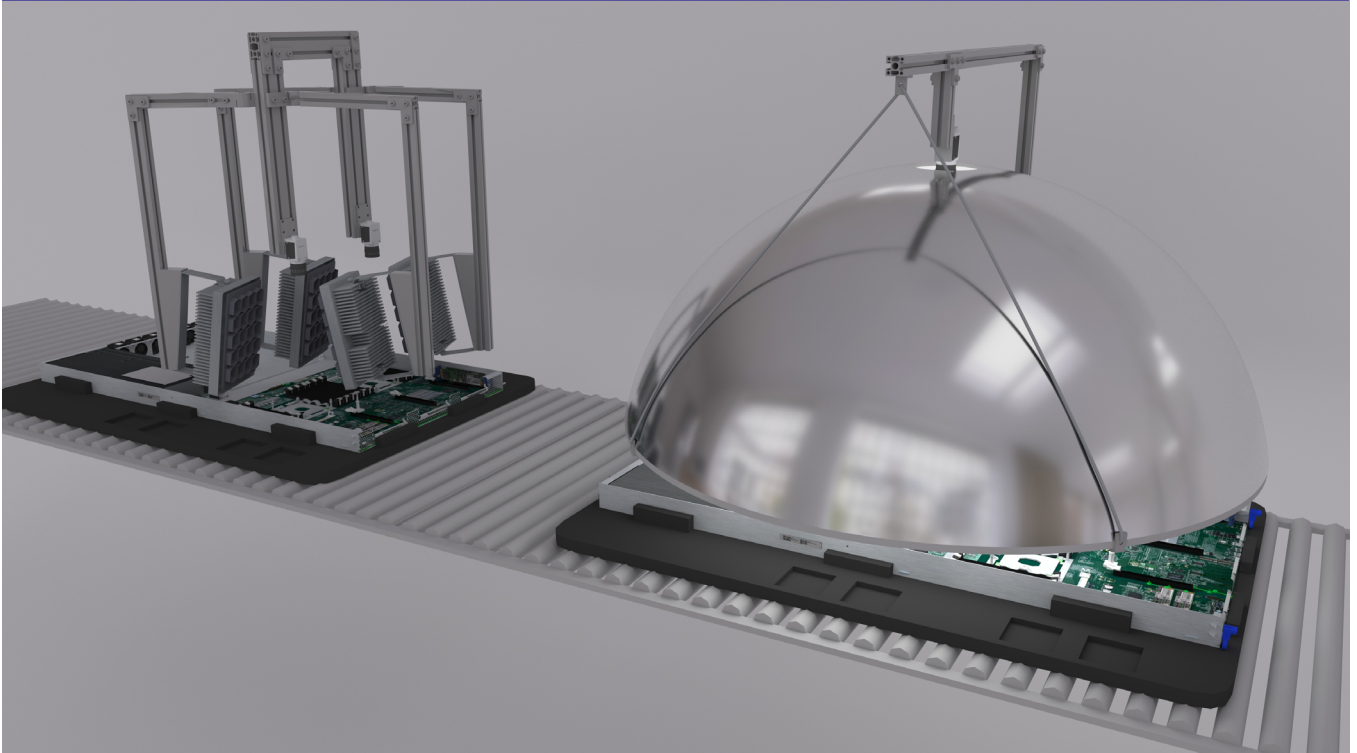
1. In the current manufacturing process a number of inspection and scanning steps must be performed manually, using costly human operation.
2. Depending on their level of expertise and their current physical or mental state, operators can perform these continuously repeating tasks with

### RESULTS:

- 1: A tenfold increase in the speed of scanning processes, integrated into the central processing system.
- 2: Reducing the use of faulty motherboards by 90%, with the help of the early detection of rejects.



## MACHINE VISION SOLUTIONS



# OUR TECHNOLOGIES

 <p><b>PROCESS OPTIMIZATION</b></p>	 <p><b>MIXED REALITY</b></p>	 <p><b>INTEGRATING ERP, SFC &amp; MES</b></p>	 <p><b>MACHINE VISION</b></p>	 <p><b>NEURAL NETWORKS</b></p>
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## PROCESS OPTIMIZATION

The solution delivered by us embodies all the knowledge we gained over the years in the fields of sales, industry, management, organisational development and integration, which guarantees that the system delivered is future proof. For successful implementation, however, a comprehensive preliminary status report and an overview of the current processes in place is vital.

Our applications can be used by manufacturing companies at various stages of manufacturing, from the beginning of the entire process to the end, as dictated by the information and dataflow. Different levels of efficiency increase can be achieved in the different modules, and the improvement factors themselves vary as well, determined by the particular area. While in the case of machine vision solutions the task can merely be to make a simple OK/NOK decision during visual inspection as quickly as possible; in the case of training support, we can examine not just the time necessary, but the quality of the learning process or feedback. And as for Shopfloor monitoring, for example, fast and comprehensive control is the top priority.

Based on our experience so far, we can conclude that the application of the solutions developed supports the discovery of further ideas and suggestions, which, in turn, can carry a return and improvement potential that can be larger than the original requirement.



## LEAN 4.0

The combined use of Lean-based manufacturing technology processes and Industry 4.0 tools can provide a solution to the future challenges of the manufacturing industry, while having a significant cultural impact in this area.

 <p>Flexible workers</p>	 <p>Active Problem Solving</p>	 <p>Prevention vs Reaction</p>
 <p>Shared destiny</p>	 <p>Shared destiny</p>	 <p>Prevention vs Reaction</p>



## MIXED REALITY

Mixed reality is the merging of real and virtual worlds to produce new environments and visualizations, where physical and digital objects co-exist and interact in real time. Mixed reality does not exclusively take place in either the physical or virtual world, but is a hybrid of reality and virtual reality. Why Mixed Reality?

AR solutions created for mobile devices are limited, as 3D perspectives and interactions are displayed in 2D. In the simulated space in VR, on the other hand, there are no interactions with our actual, real environment.

In contrast, Mixed Reality allows the simultaneous display of virtual models and the physical environment, thereby immersing the user in the interactive experience.



## INTEGRATING ERP, SFC & MES

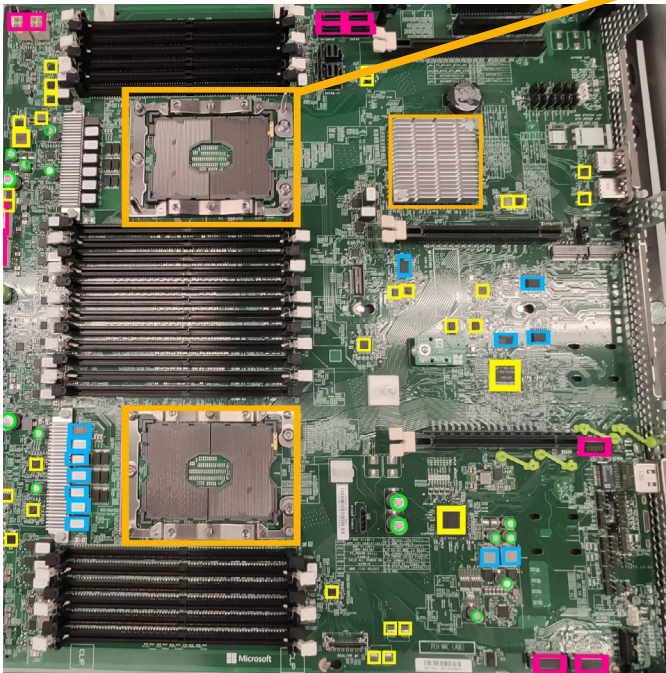
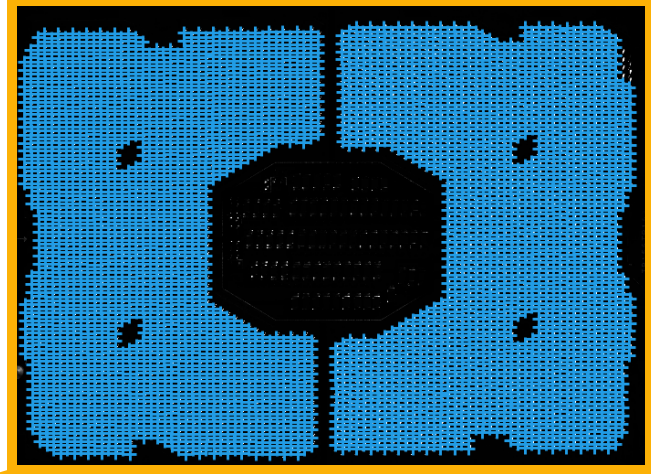
To perform display and evaluation tasks, our applications use reliable, real time data from manufacturing processes. To retrieve these data, access to, and communication with existing central systems is vital.

No matter the system used, be it ERP, Shopfloor Control or MES, the modules developed by us come with the necessary integration tasks executed, which prevents any inconsistencies or duplications in data.



## MACHINE VISION

Machine vision-based systems were originally created to solve tasks beyond human perception, and to automate and model tasks related to human vision. Their use is ideal in situations where the inspection of the items to be examined with the human eye cannot be carried out efficiently: in the case of rapid counting of manufactured products, inspection of their size or quality, search for small defects or scanning of machine codes.



## NEURAL NETWORKS

Neural networks, borrowing the working principle of the nervous system, work with models that are not manually generated but trained. It is worthwhile to reach for this tool when the objects to be examined cannot be well described, so people with a lot of experience are needed to perform the task effectively. By using a sufficient amount of images (data), the system can be trained to draw quick and correct conclusions that do not require human intervention.



## OUR REFERENCES

 FOXCONN® ARaymond® Kimball®  
Electronics Audi flex® otpbank APTIV® TRIGO  
QUALITAIRE Tarkett

## FROM OUR CUSTOMERS:

„I would like to tell you about the wow-factor in connection with using your application: in the first few days, our colleagues just followed us with interest, wondering what we were doing with those goggles on our heads, however, when we asked them to try it, they were floored by the fact that it is possible to develop systems that have real use in a production environment!“

„On behalf of the whole test engineering team, I would like to express our excitement about the possibility to participate in this project. I am sure that step by step, we will be able to achieve everything on the list of functions we have dreamt up, and that we will have some great new ideas and suggestions along the way.“

„I have participated in a number of presentations recently where I was showed what this technology is capable of and the functions it may be able to perform. However, this is the first application which is finally realistic and not just a concept! It was developed to fulfill a specific and real business need and I can believe it is up to the task!“