AI-based Paint Inspection & Automated Repair Workflow

KONICA MINOLTA & EINES VISION SYSTEMS FOR MOBILITY

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Are you ready to make your **PLANT SMART?**

PAINT EXPO 2026

Event Content

Introduction
Who we are
Quality Control for Manufacturing Process
Paint Shop Inspection Technologies
ESFI – EINES Paint Inspector Tunnel
ESFI – Features and Architecture
ESFI – Use Cases and Success Stories
ESFI – Technology adapted to MOBILITY
Other Paint Shop Inspection Technologies
Sealer Check
Konica Minolta Sensing Devices

Who we are?

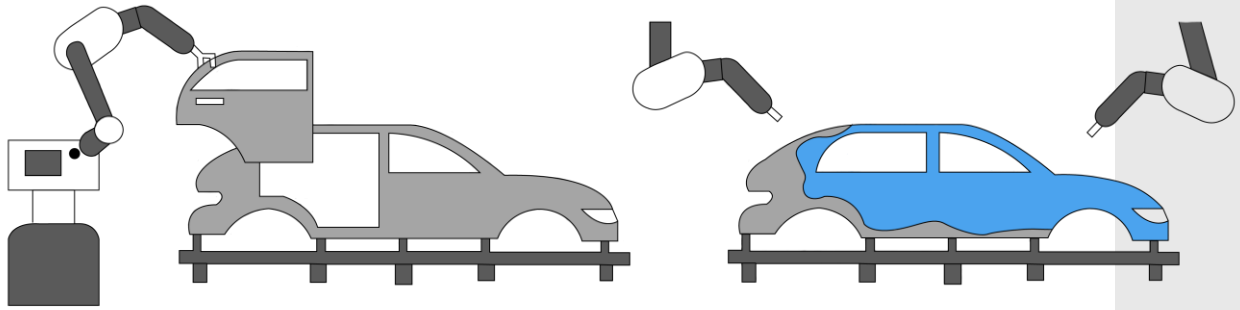
At EINES, we are specialists in artificial vision systems developed exclusively for quality control in the automotive industry.

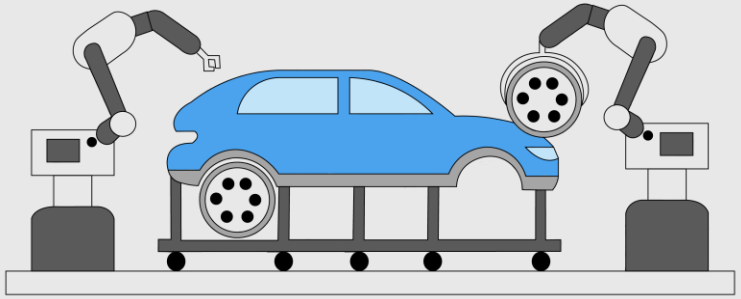
We collaborate with OEM manufacturers and Tier 1 suppliers to automate inspections at every stage of production.

From **press shops, painting and metrology to final assembly**, we ensure consistent quality, reduce production costs and digitize data to improve traceability.

OUR VALUE PROPOSAL

- GLOBAL PRESENCE WITH LOCAL TECHNICAL SUPPORT
- ADVANCED AND FLEXIBLE TECHNOLOGY
- END-TO-END INNOVATION IN INSPECTION SOLUTIONS
- DATA DIGITALIZATION AND ANALYTICS
- INTERNATIONAL RECOGNITION AND STRATEGIC PARTNERSHIPS
- COMMITMENT TO SUSTAINABILITY

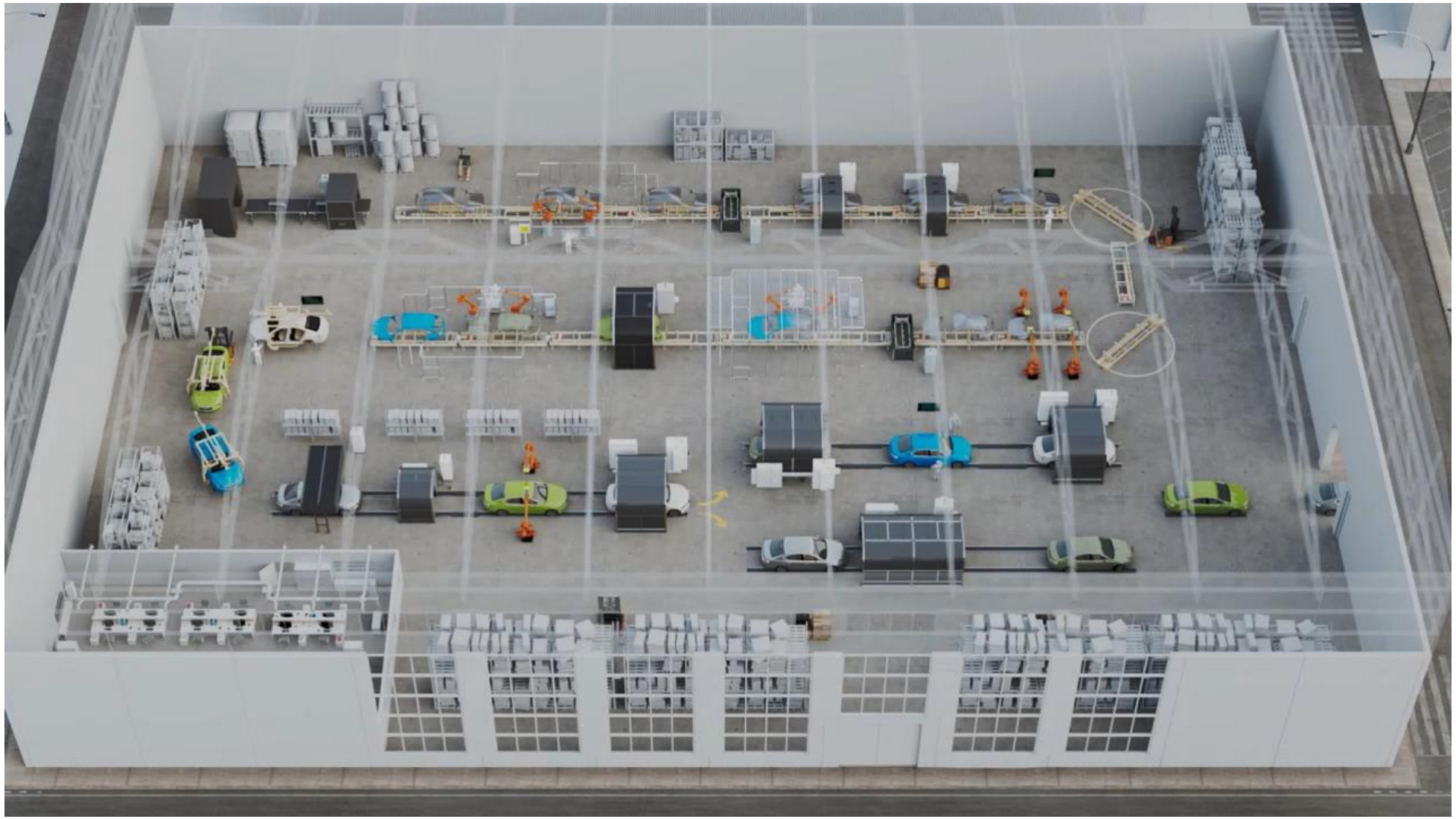




We are part of:

KONICA MINOLTA

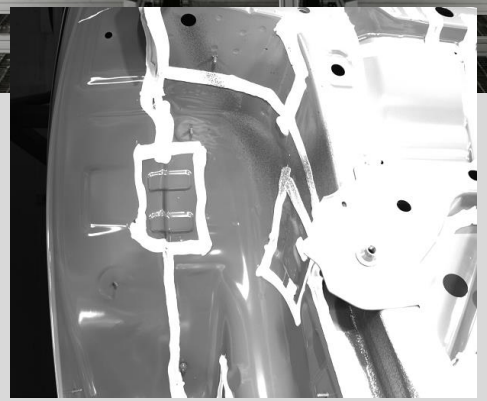
Quality Control for the entire Car Manufacturing Process



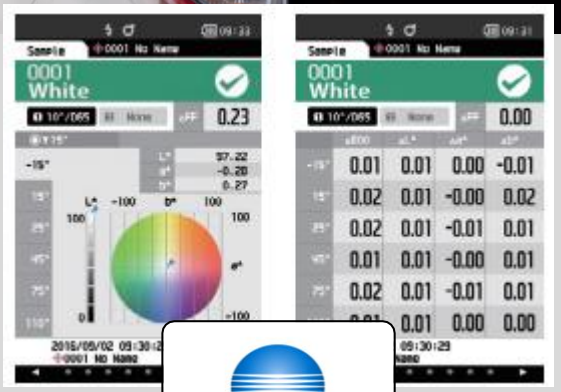
Paint Shop - Surface Inspection Technologies

Automatic Paint Defect Detection and Repair

Sealant Validation



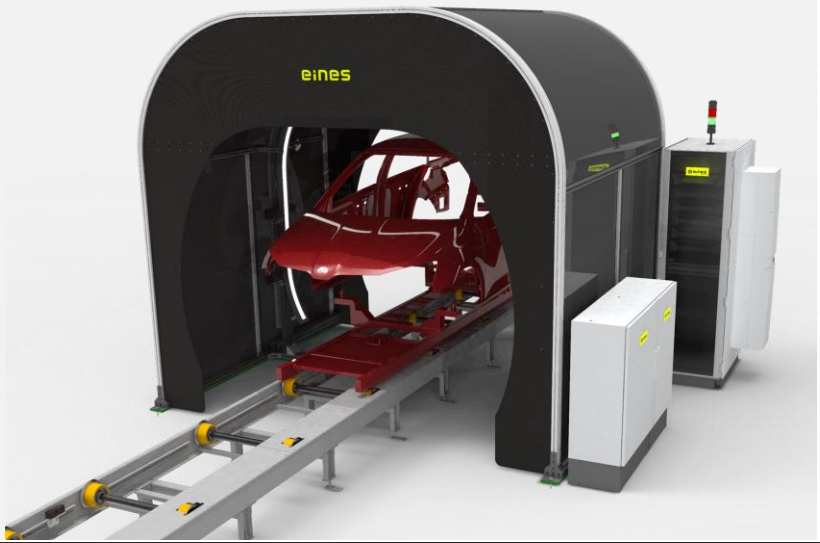
Colour, Gloss and Appearance



KONICA MINOLTA
Sensing Devices

esφi | Features & System Architecture

This tunnel is capable of **detecting, locating, and classifying paint defects** on the production line during the manufacturing process, specifically in the **paint shop**.



esqi | Total Quality Control at Paint Shop

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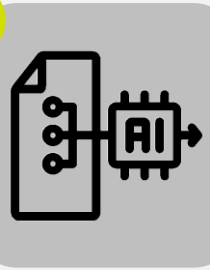
SIMULATION &
DIGITAL TWIN

1

VISION-BASED
DEFECT LOCALIZATION

2



DEEP LEARNING DEFECT
CLASSIFICATION

3

DEFECT
VIEWER

4

AUTOMATIC OR
MANUAL REPAIR

5

REPORT
& ANALYSIS

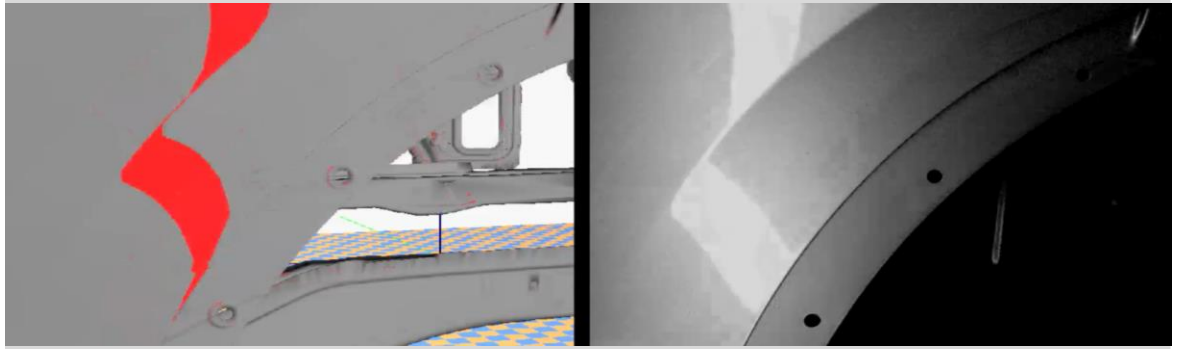
6

PROCESS
OPTIMIZATION

0

Simulation and Digital Twin

Tunnel Digital Twin



DESIGN PHASE

Inspection Solution
Vehicle design
Areas scanned

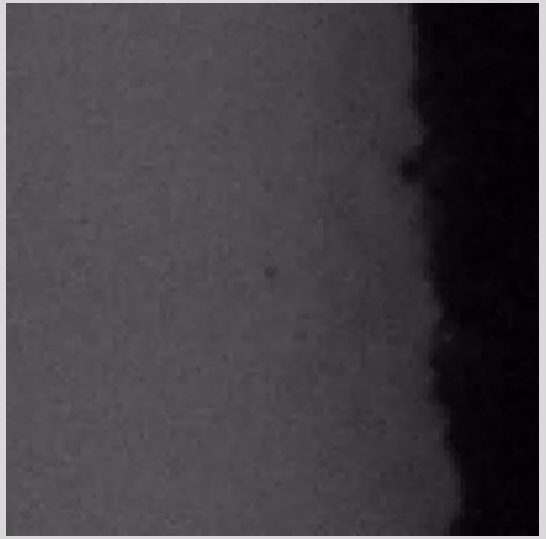
Expandible
Future Models

Camera Number Optimisation

System Requirements Pre-planning

Implementation Time Reduction

Synthetic Defect Simulation



Real Images

Simulation Images

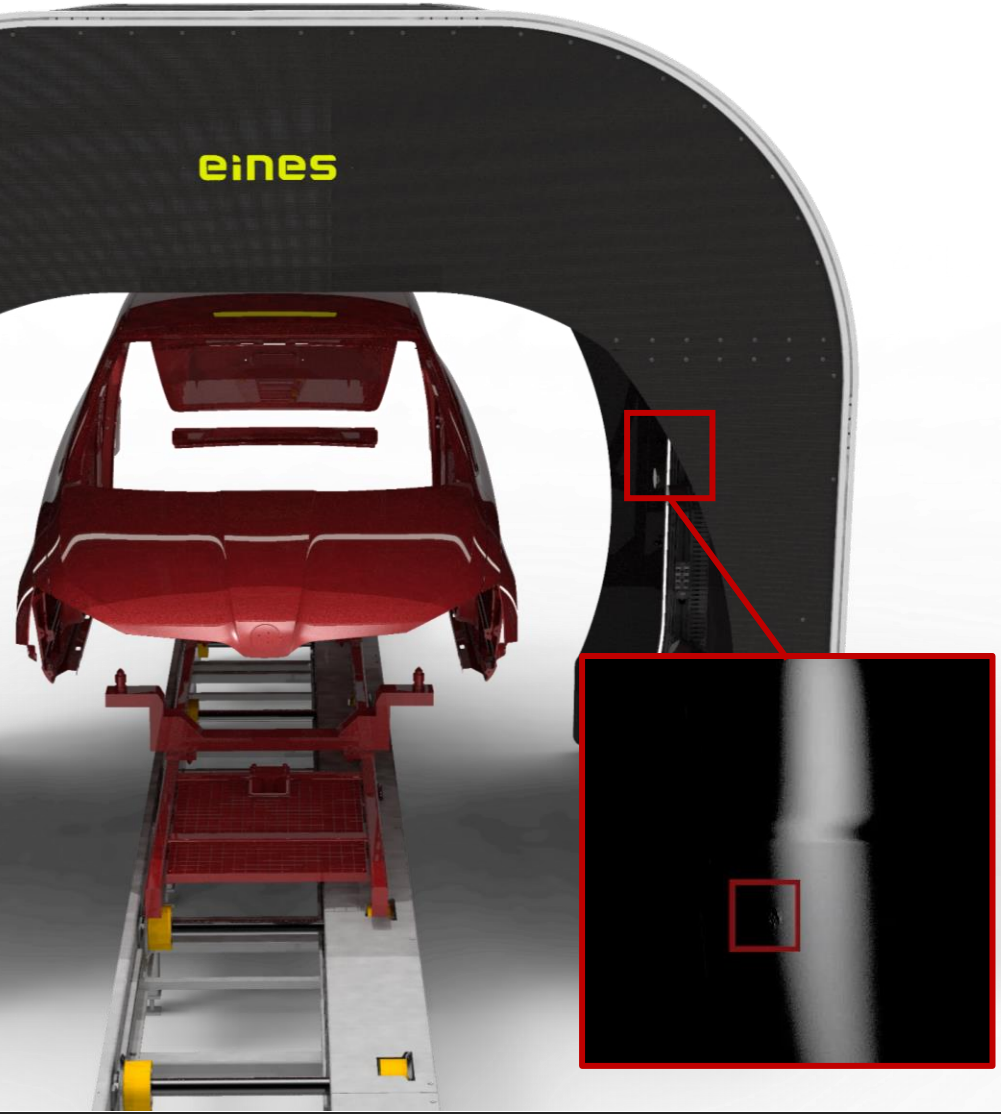
Accurate and flexible Classification

Reduce Commissioning Time

KONICA MINOLTA
Japan Data Analyst

1

Vision-based Defect Localization



The 3rd ESFI Generation: AI all integrated

ALL KINDS OF PAINT DEFECTS

SUPERIOR SENSITIVE WITH HIGH ACCURACY

DEFECTS IN CHARACTERISTIC LINES AND EDGES

COLOR INDEPENDENT

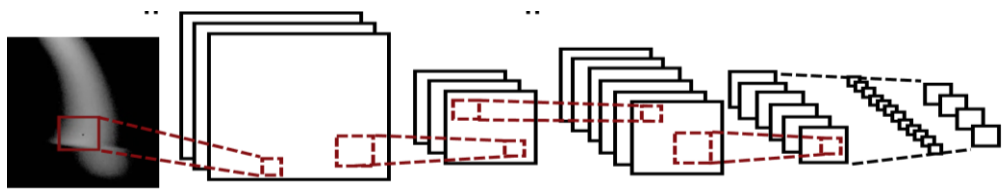
AUTOMATIC CAR MODEL CONFIGURATION

2

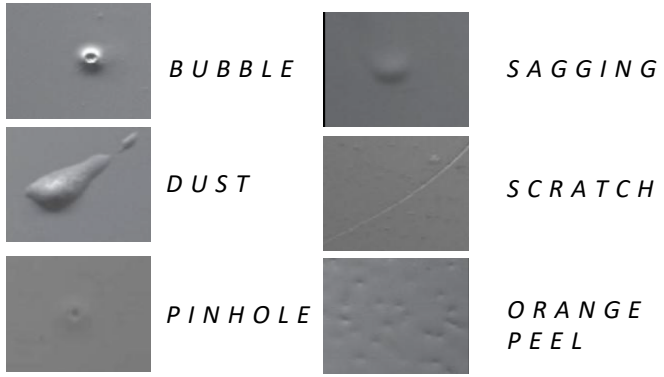
AI-Driven Defect Classification

Data Collection

Neuronal Network Model for Defect Classification



Defect Classification Result



KONICA MINOLTA
Japan Data Analyst

MULTI-KERNEL CPU TECH

CNNS FOR LEARNING & CATEGORISING DEFECTS

3D MAPPING

LIST OF DEFECTS WITH THE FOLLOWING INFORMATION:

- CARIN
- Colour
- Number of defects
- Defect #n
  - Coordinantes x, y, z
  - Angles a, b, c
  - Type defect
  - Part ID.
  - Etc.

3

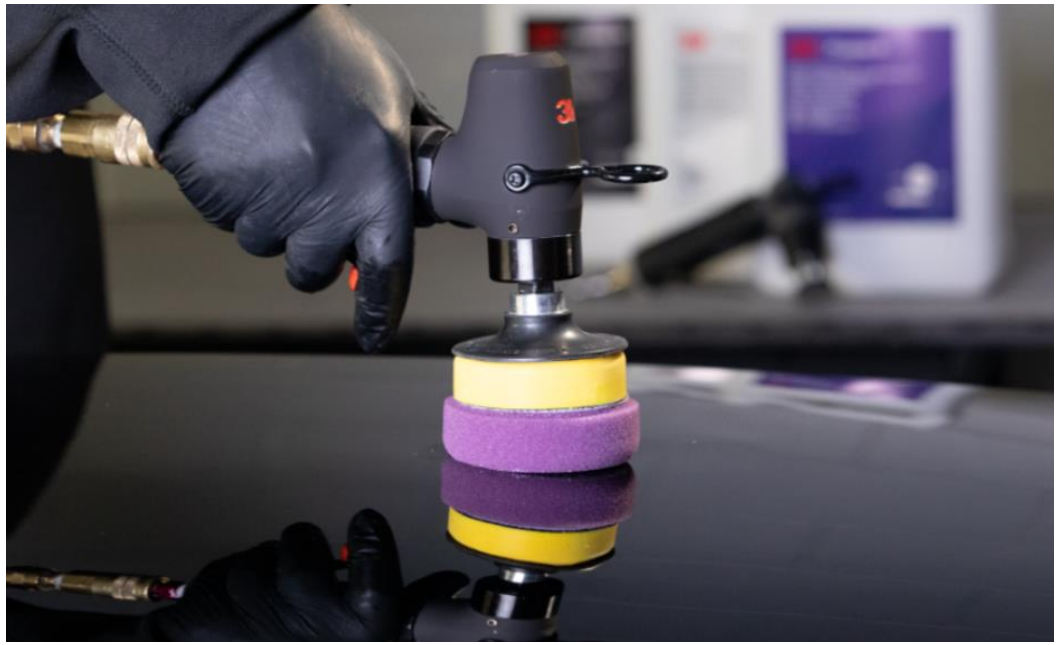
Paint Defect Viewer

Detection of the defects

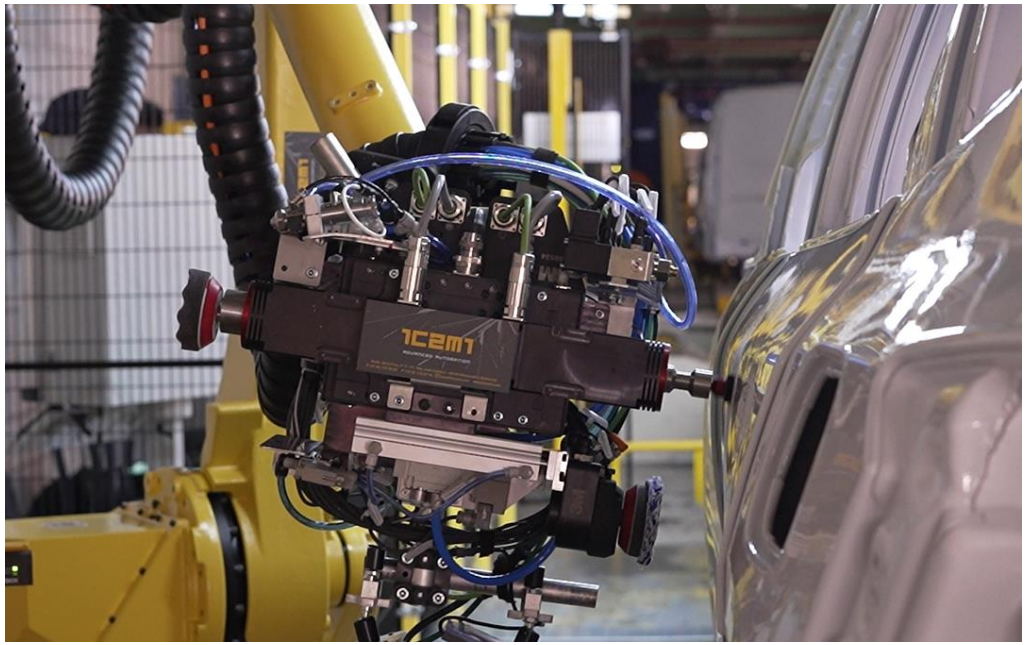
Manual Repair

Automatic Repair

Display defects for the workers to repair

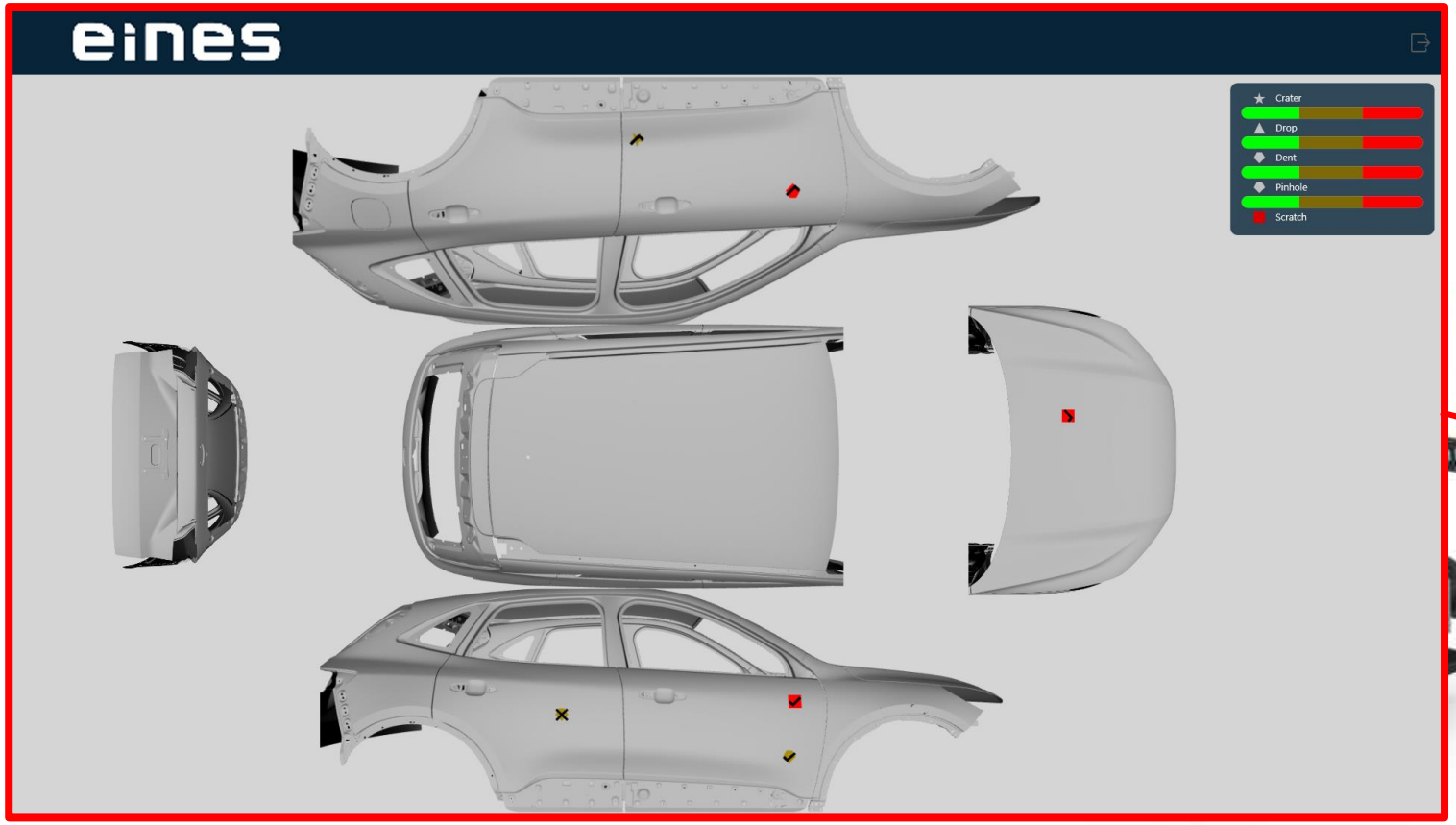


Send the data of the defect (size, position and type) to the Robotic System



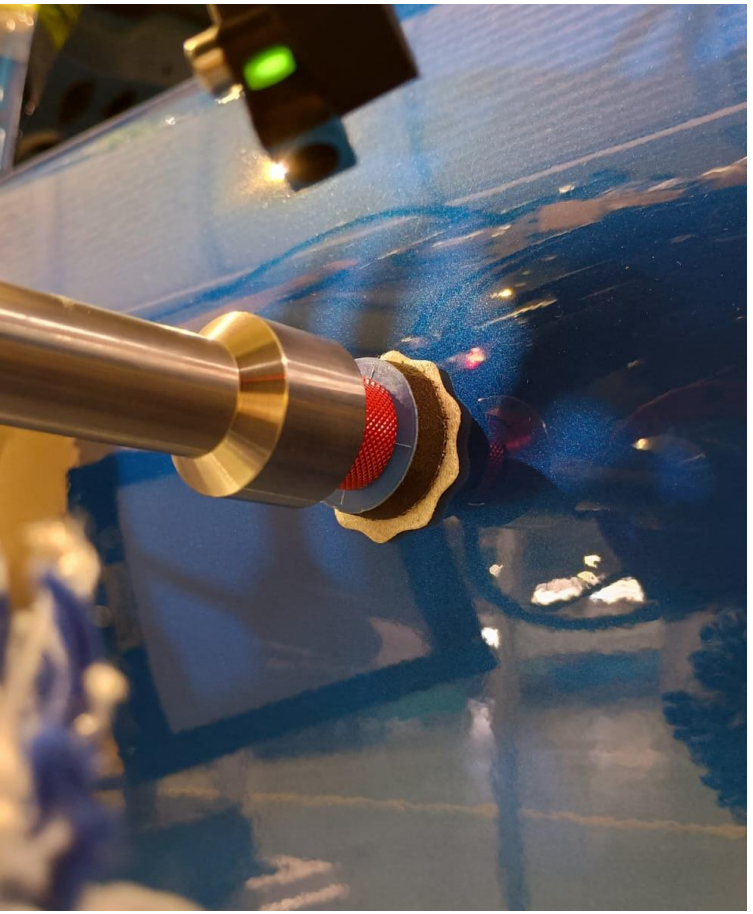
3

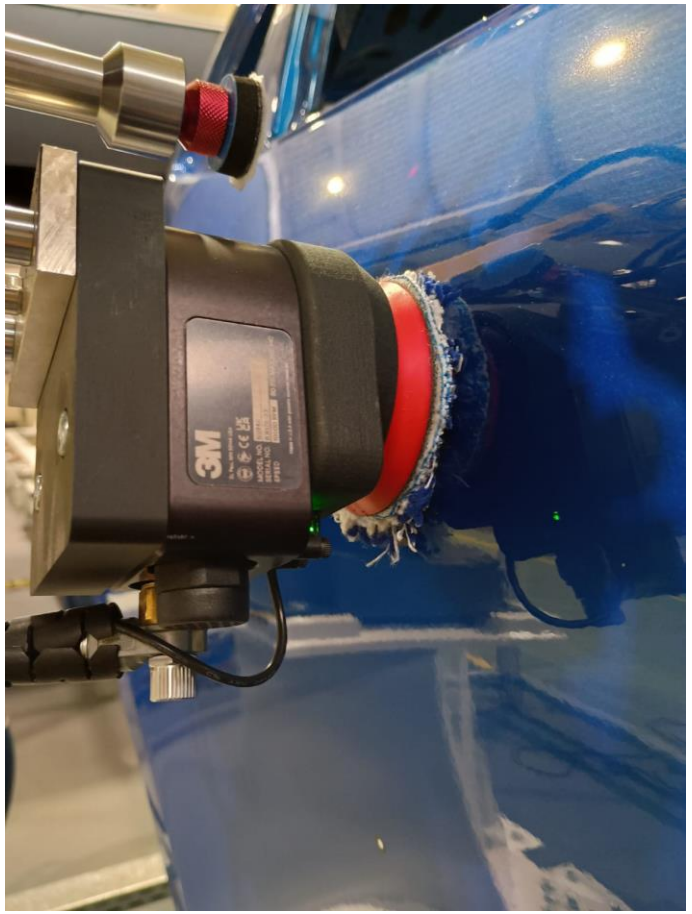
Paint Defect Viewer for Manual Repair Actions



4

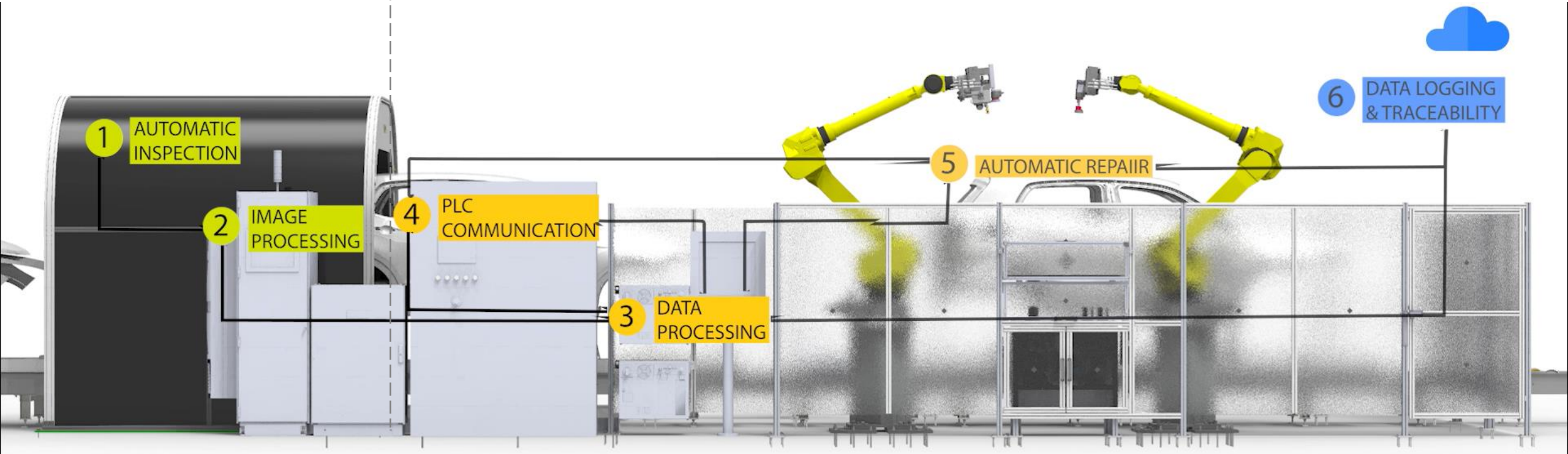
Automatic Sanding, Cleaning & Polishing





Comunication Flow – Autorepair Example

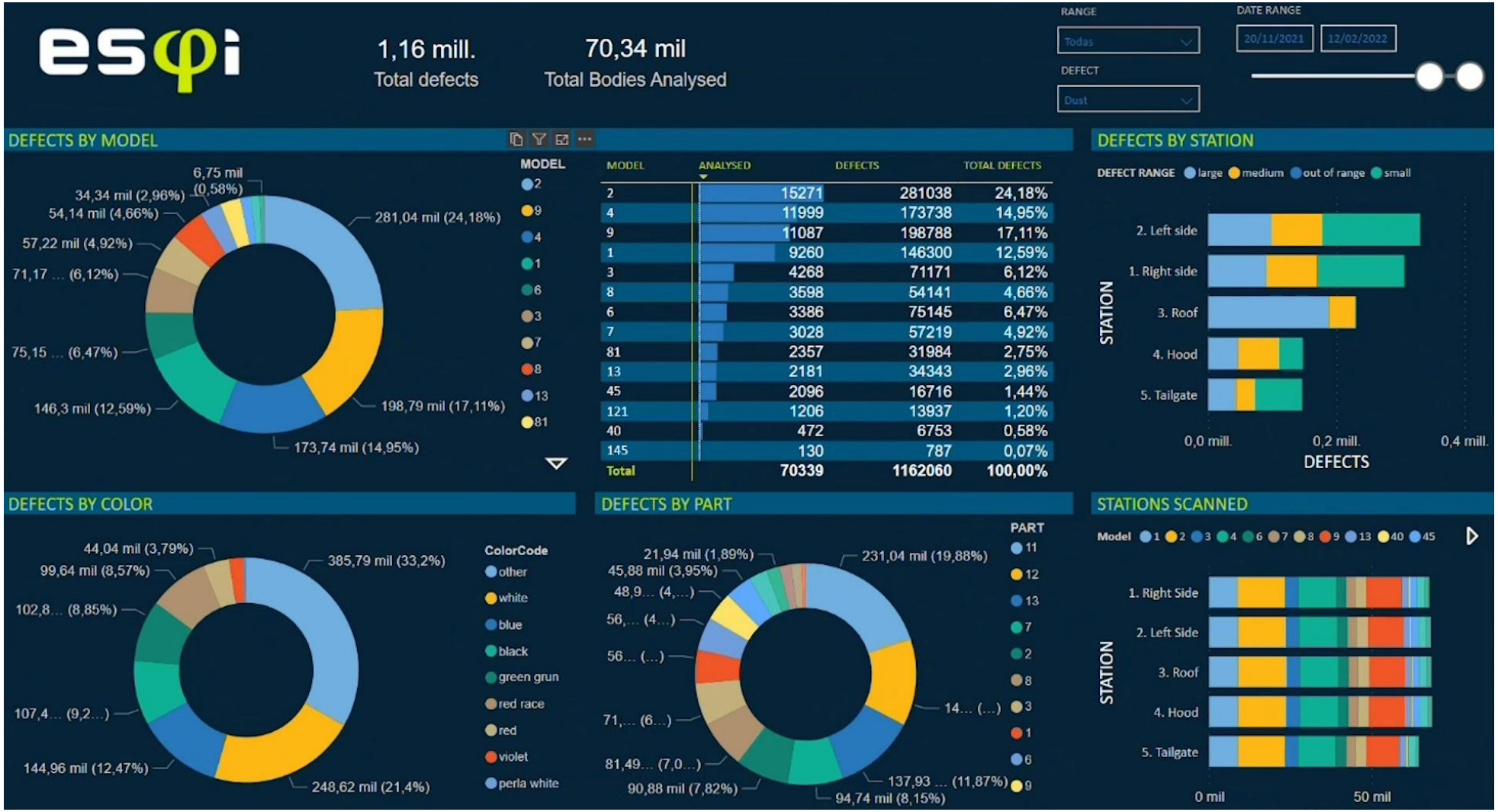
einES	TCEMT
AUTOMATIC DEFECT DETECTION SYSTEM	AUTOMATIC SANDING POLISHING SYSTEM



All actions are logged and shared with the customer system

5

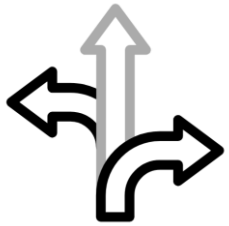
Reports & Analysis



What stands out in this solution?

ADAPTABILITY

of the process to the customer's specific plant layout, production flow, and quality standards



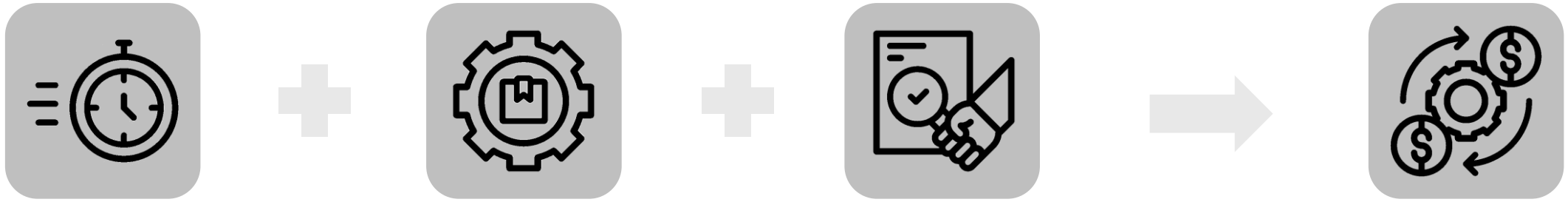
FLEXIBILITY

of handling various defect types, vehicle models, and production phases with minimal reconfiguration

MODULARITY

enabling easy maintenance, quick part replacement, and scalable system upgrades without production downtime

Remarkable Benefits of Automatization



TIME EFFICIENCY

CONTROL OF THE PROCESS

SUBJECTIVITY ELIMINATION

COST OPTIMIZATION

We can analyze **your specific production case** and prepare a **customized business case and ROI study** to evaluate the potential impact of the solution.

Use Case 1 |


eines
大众安徽
“0缺陷”
漆面检测


40000张
每台车采集图像

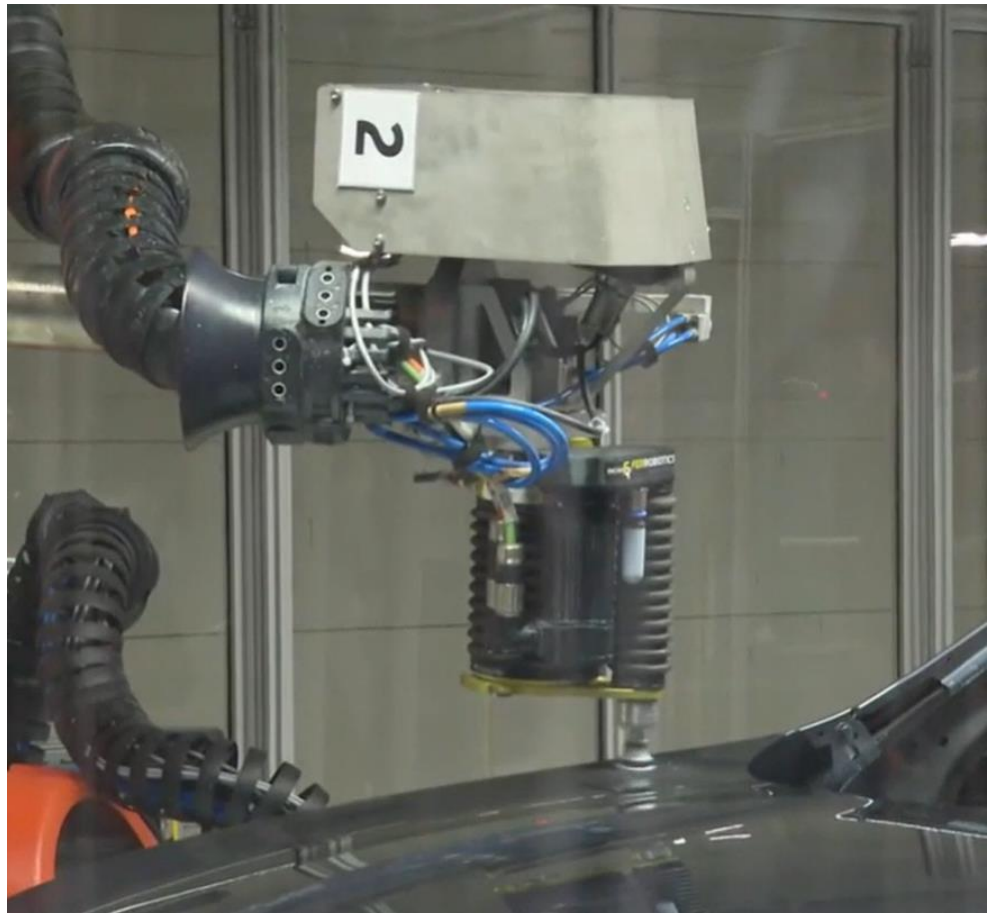

eines
03.12.2025 17:25:43
Nb Defects 1
UG
全程数据可溯源
实现质量追踪和管理

Use Case 2 |

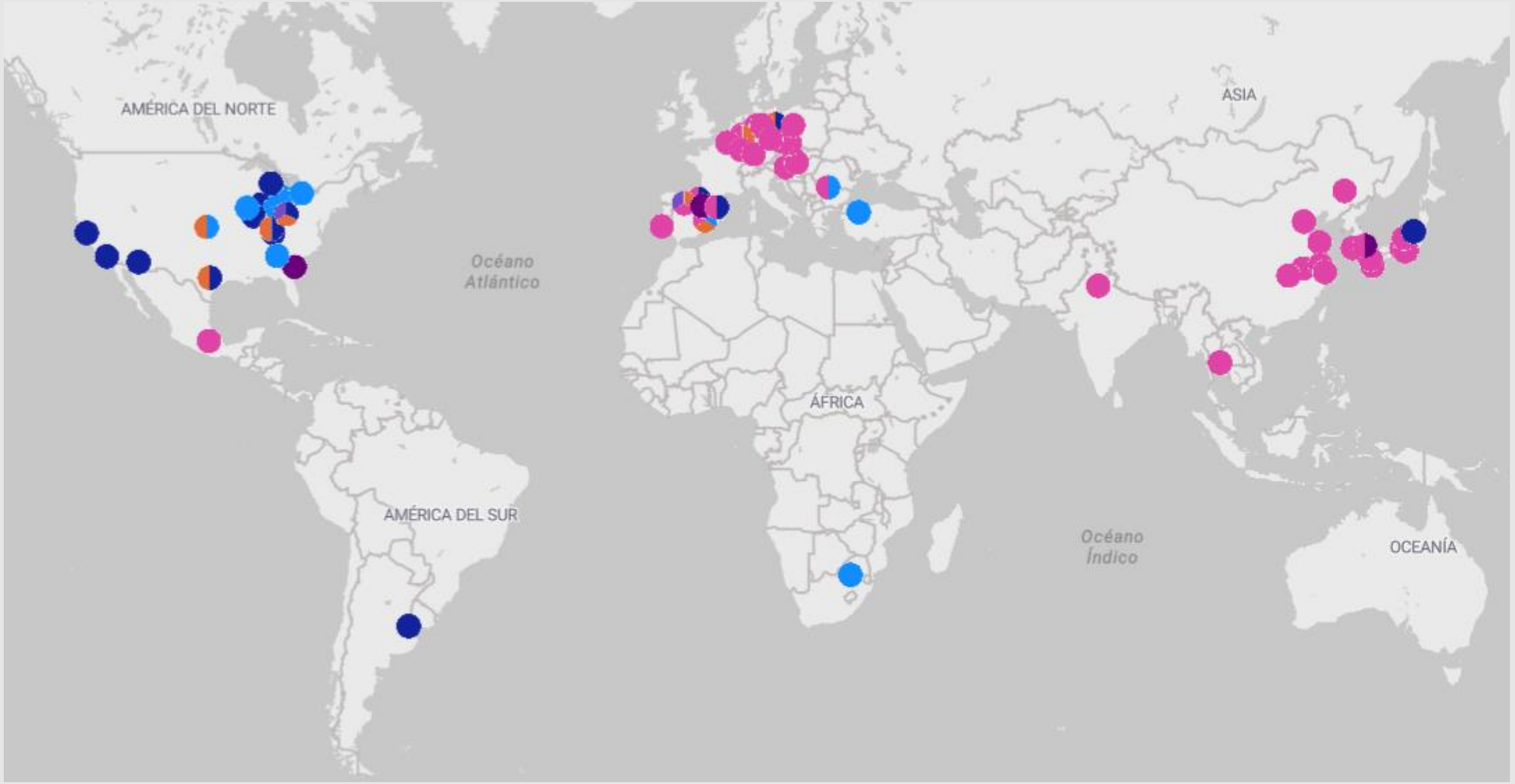

Paint Shop
โซนตรวจสอบคุณภาพการพ่นสี


เทคโนโลยีตรวจสอบคุณภาพสี
Automated Scanner

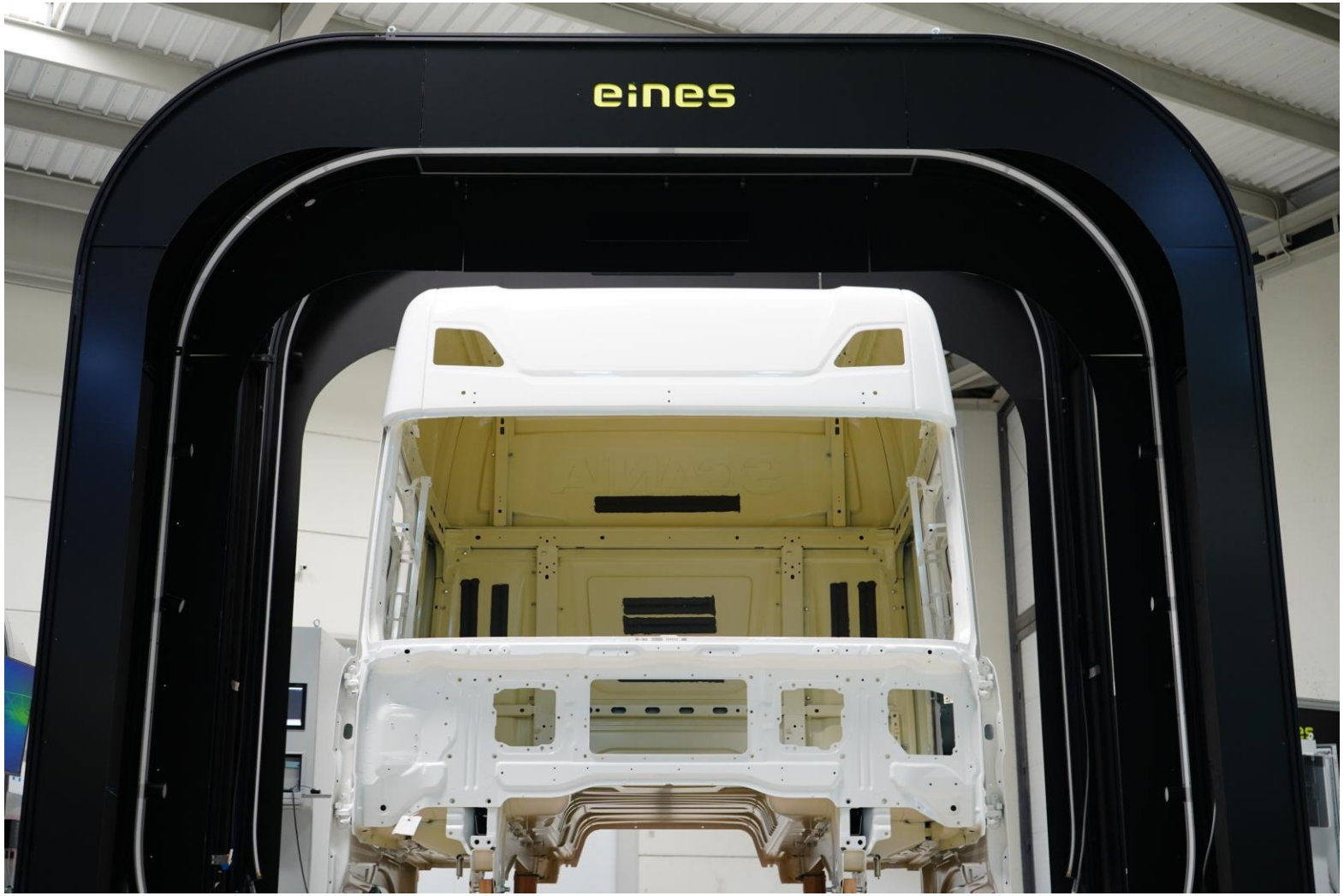
Use Case 3 |



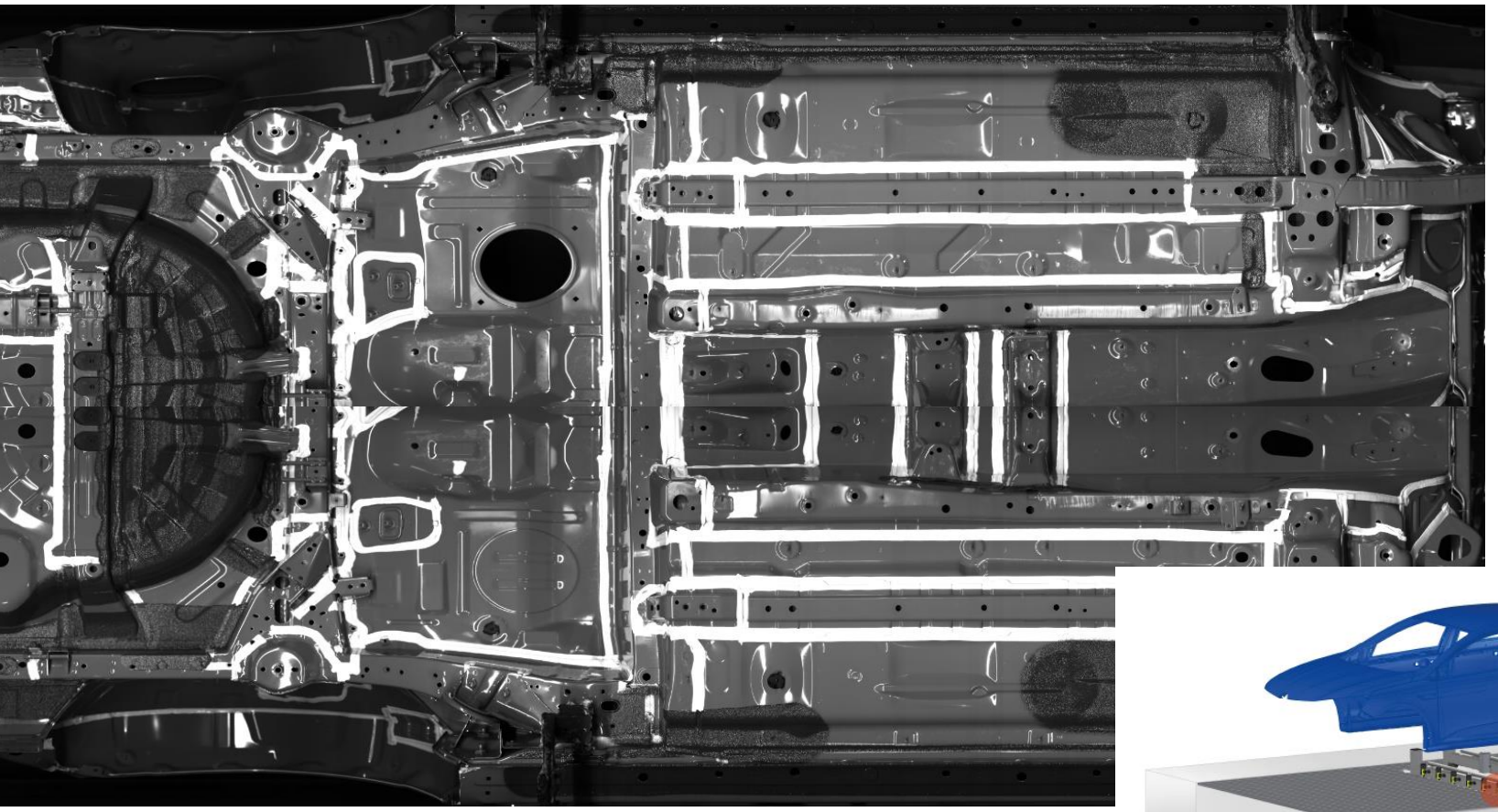
Hundreds of success stories

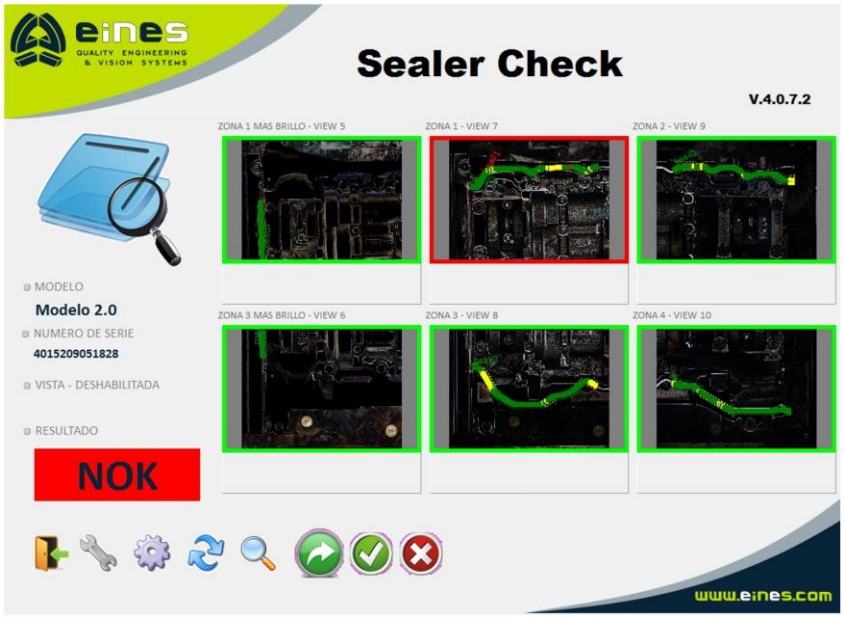

AMÉRICA DEL NORTE
Océano Atlántico
ÁFRICA
ASIA
AMÉRICA DEL SUR
Océano Índico
OCEANÍA

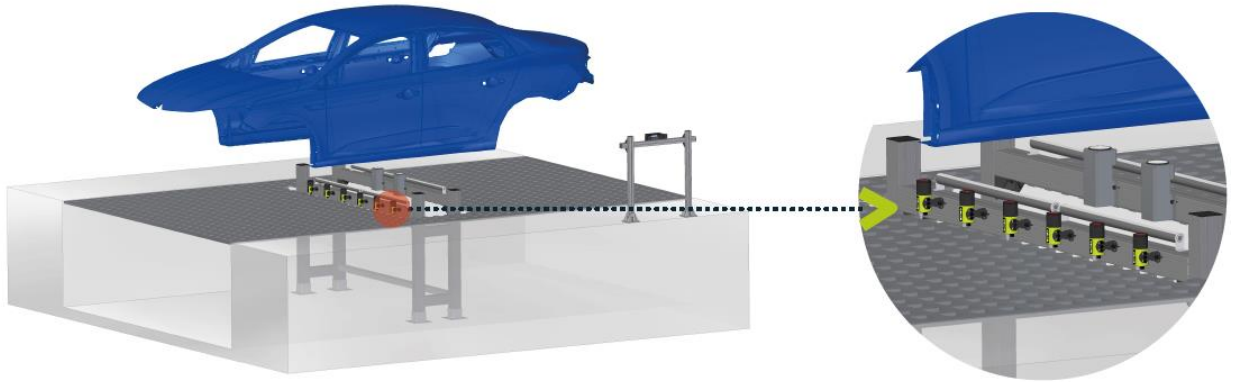
ESFI – Adapted to trucks, bumpers and small parts



Other applications – Sealer Check







Other applications – Colour, Gloss and Appearance

CM-M6

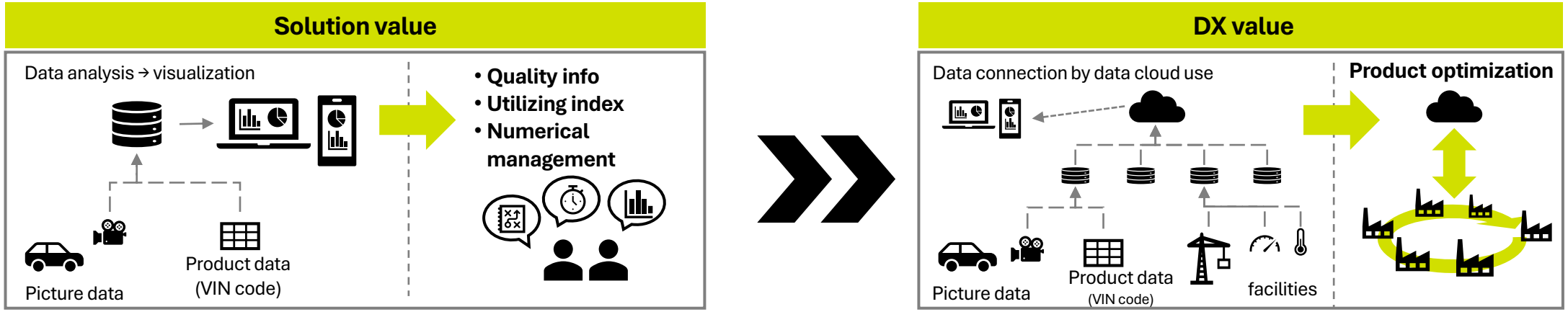
- ✓ Portable multi-angle spectrophotometer for **accurate color characterization** of metallic and effect paints.
- ✓ 6 angle double-path measurement system for capturing the **directional effect of coatings**
- ✓ The device has a **small footprint** measuring aperture ideal for curved surfaces that are impossible with traditional measuring devices.

Rhopoint TAMS™

- ✓ Portable machine vision system with innovative Quality and Harmony data for assessment of surface finish of all panels as part of a whole.
- ✓ The Rhopoint TAMS™ was developed to measure not just the final finish but the surface through the coating process.

Process Optimization

Konica Minolta Environment: All-in-One Umbrella



Everything Connected

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Smart Manufacturing

=

Efficient Productivity

eines

AI-based Paint Inspection & Automated Repair Workflow

KONICA MINOLTA & EINES VISION SYSTEMS FOR MOBILITY

Landing page

Contact us

Contact Philipp

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