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Artificial Intelligence for Digital Industries

Michal Zlotek | October 2019

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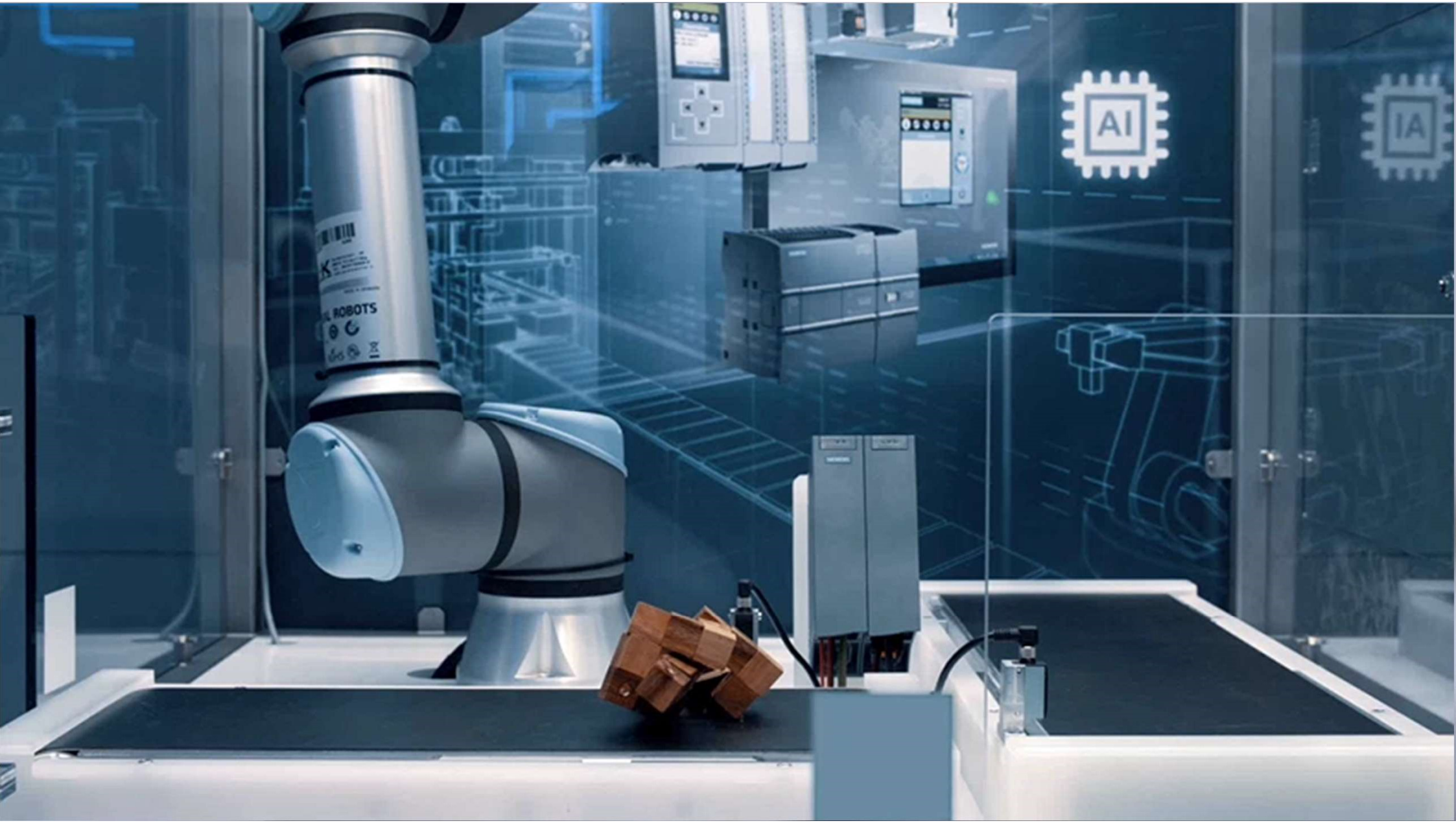
siemens.com/futureofautomation


AI
IA

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Flexible grasping using artificial intelligence

Artificial intelligence makes it possible to grasp arbitrarily shaped and positioned objects.

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AI

Artificial Intelligence modules for Siemens S7-1500 Programmable Logic Controller

Highlights

- Neural Compute Engine with on-device deep neural networks
- Powerful vision / imaging processing onboard

Potential use-cases

- Robotics learning
- Visual quality inspection
- Anomaly detection / Condition monitoring
- Additive manufacturing

Benefits

- Use AI to optimize the manufacturing process
- No separate IPC needed
- Direct communication to PLC reduces engineering effort

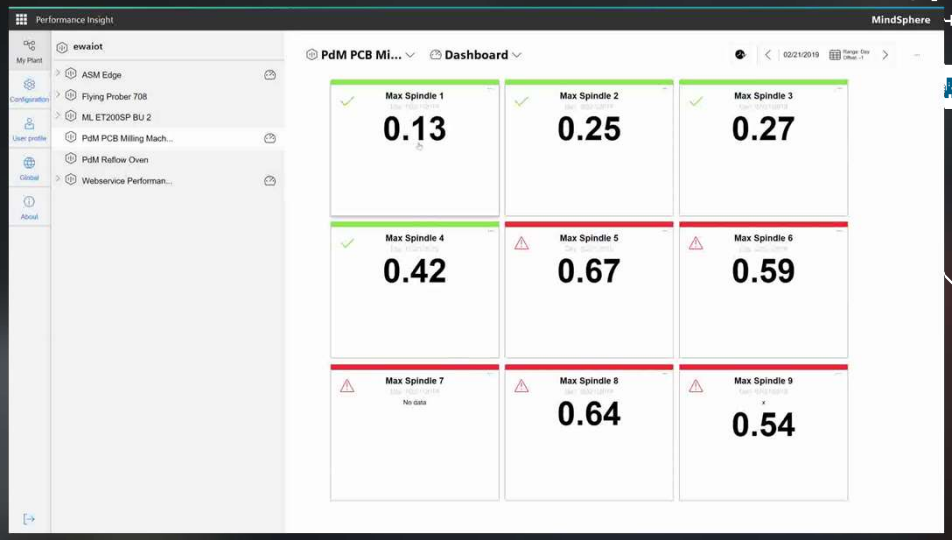
PCB cutting machine

Siemens Electronics Factory
Amberg, Germany

The challenge

Aggressive milling dust causes drive bearing to get stuck

Non production critical level



MindSphere

AI

Training
of Algorithm

Smart Data
Transfer

App
Deployment/
Update

Proxy

Production critical level

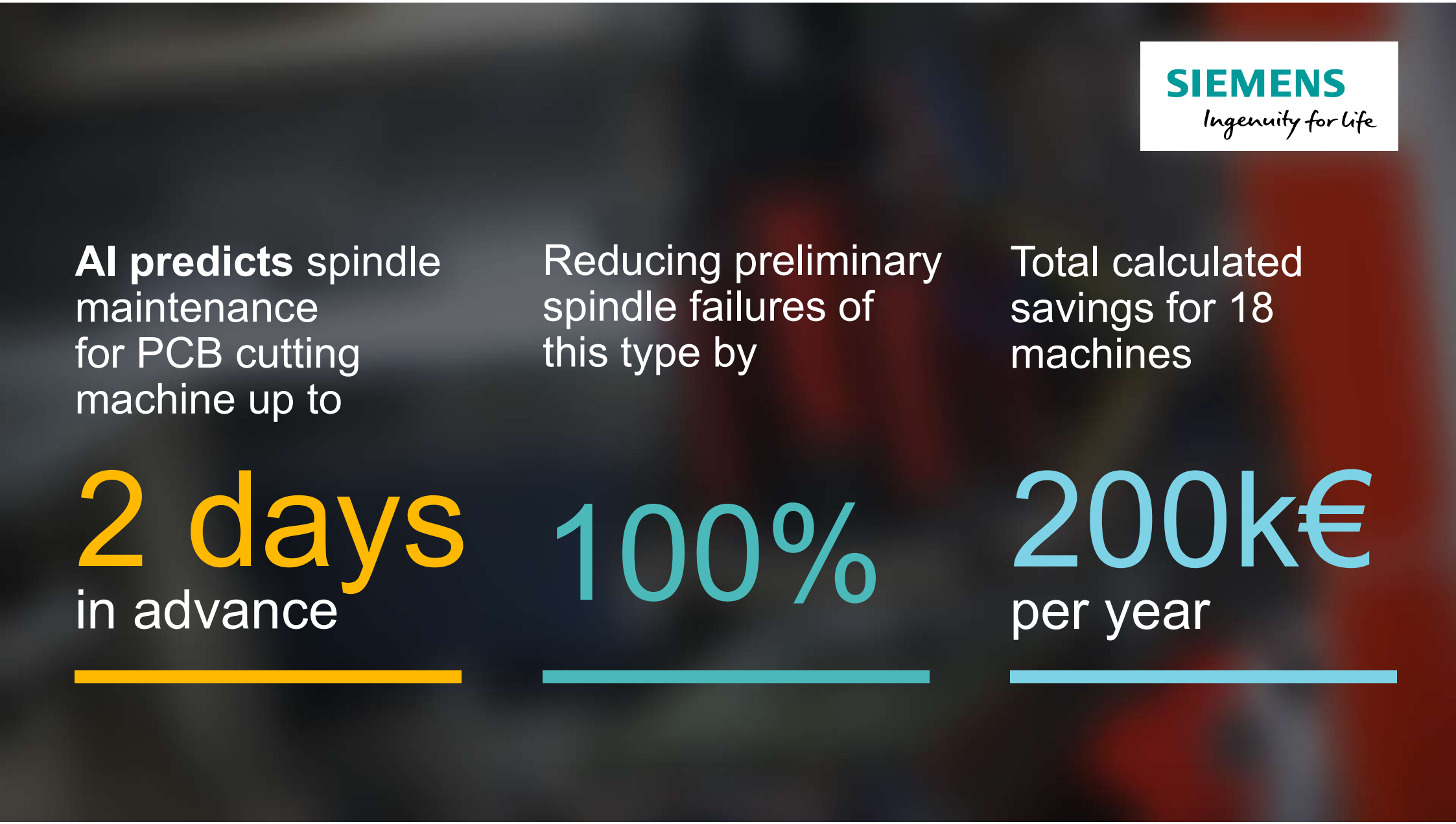
Anomaly detection
for Predictive maintenance

AI

Edge Device

Machine data

PCB cutting machine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AI predicts spindle maintenance for PCB cutting machine up to
2 days
in advance
Reducing preliminary spindle failures of this type by
100%
Total calculated savings for 18 machines
200k€
per year

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X-ray-based PCB quality assurance

Siemens Electronics Factory Amberg, Germany

Challenge

Production output of SMT line limited by time consuming X-ray Quality tests

Every further X-ray machine requires additional invest of €500,000

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Non Production Critical Level

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AI

Training of Algorithm

MindSphere

App Deployment/Update

Continuous data storage

Proxy

Production Critical Level

Captured Data

Real time capturing of >40,000 production parameters

Peak volume of 10 MB/s

AI

PCB Quality Prediction Algorithm

X-RAY Testing necessary? YES or NO

Edge Device

X-RAY

No X-Ray

Assembly line

Manufacturing Execution System

EWA Production Line

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Minimization of necessary X-ray tests by up to

30%

Quality rate of

100%

Reduced capital invest for further X-ray machines of

€500,000

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