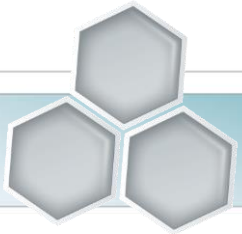# Smart Factory – MB PalaMax®

Presentation

Smart Factory – PalaMax Intro

Social and economic challenges
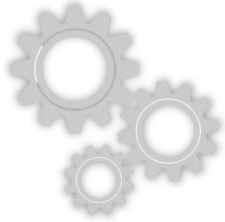
WHERE DO WE COME FROM?
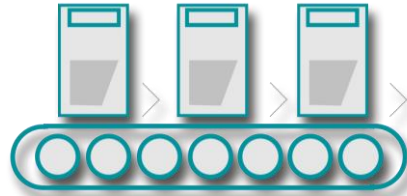

WHERE DO WE GO?

Industrial Revolutions – 1800 till now

Mechanization

Electricity & Assembly Lines

Microelectronics & Computers

Digitalization & Connectivity

1800
INDUSTRY 1.0

1900
INDUSTRY 2.0

1970
INDUSTRY 3.0

2000
INDUSTRY 4.0

Machines powered by Water & Steam

Acceleration of Working Processes

Automated Production

Internet of Things

Railway, Textile Mills

Telecommunication

Personal Computers, Mobile Communication, Internet

Everything becomes „Smart"

10/9/2019

Smart Factory – Here we go …

SMART FACTORY
INDUSTRY 4.0 ENABLED

SMART PRODUCTION MANAGEMENT

SMART MATERIAL MANAGEMENT

TRANSPARENCY OF YOUR PRODUCTION
- Real time monitoring during production
- Track & trace each individual product
- Minimize maintenance

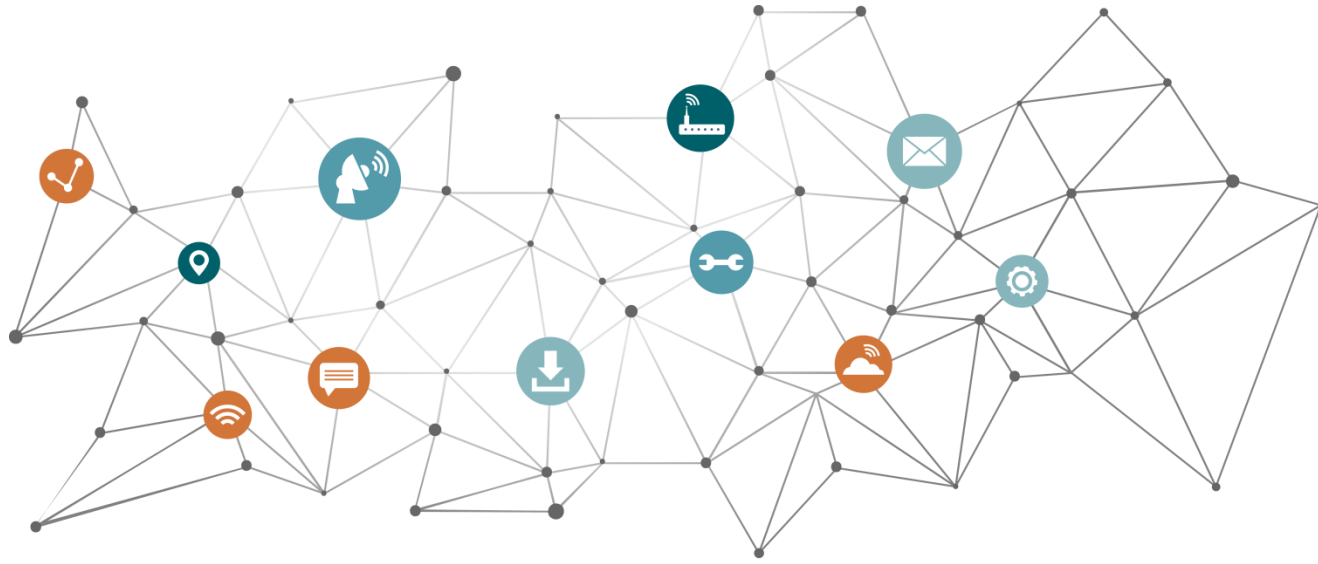|	
PRODUCTIVITY	**+50 %**
EFFICIENCY & SPEED	**+30 %**
COST REDUCTION	**+20 %**

- **SECURING FUTURE COMPETITIVENESS**
- **NEW BUSINESS MODELS**
- **NEW SERVICES**

Mühlbauer's Smart Factories for Semiconductors, RFID, Smart Card & ID Documents

"Industry 4.0 – Smart Factory or the Industrial Internet of Things (IIoT)",

Aims to both increase the automation and facilitate the interaction between humans and systems and between systems. The overall goals of Smart Factory are production benefits such as increased efficiency, higher transparency and reduced costs.

*If you can't **measure** something, you can't **understand it**.*

*If you can't understand it, you can't **control it**.*

*If you can't control it, you can't **improve it**.*

PalaMax
Total Process Transparency

- Better data: automatically, accurate and unbiased data collection
- Monitor live performance
- Analyze OEE data in Real Time
- Continuous visualization allows fast reaction
- Historical data analysis
- Active system supports you with notifications and reports
- Run more units but save rejects and money
- Easy to configure, easy to use, easy to leverage
- Runs everywhere
- Integration of MB and 3rd Party equipment

TRANSPARENCY OF YOUR PRODUCTION

PalaMax – Modules

Production Transparency

- Constant up-to-date & transparent overview of the production
- Allows immediate reaction on aberrations, saving Time and Money
- Tracks and documents your productivity.
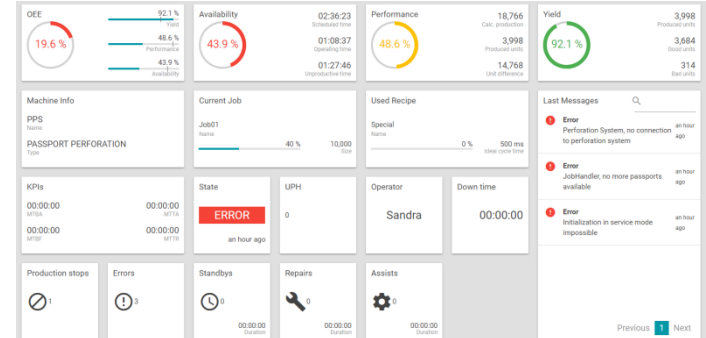- Automated data collection delivers unbiased and accurate reports.

Preventive Maintenance

- Enables planning of scheduled production down times
- Supports the maintenance planning and execution to be more efficient
- Less unplanned downtime caused by equipment failure
- Less unnecessary maintenance and inspections

Track&Trace

- Track and Trace of individual units
- Allows the comparison of manufacturing runs among each other
- Detect and define reasons for production faults
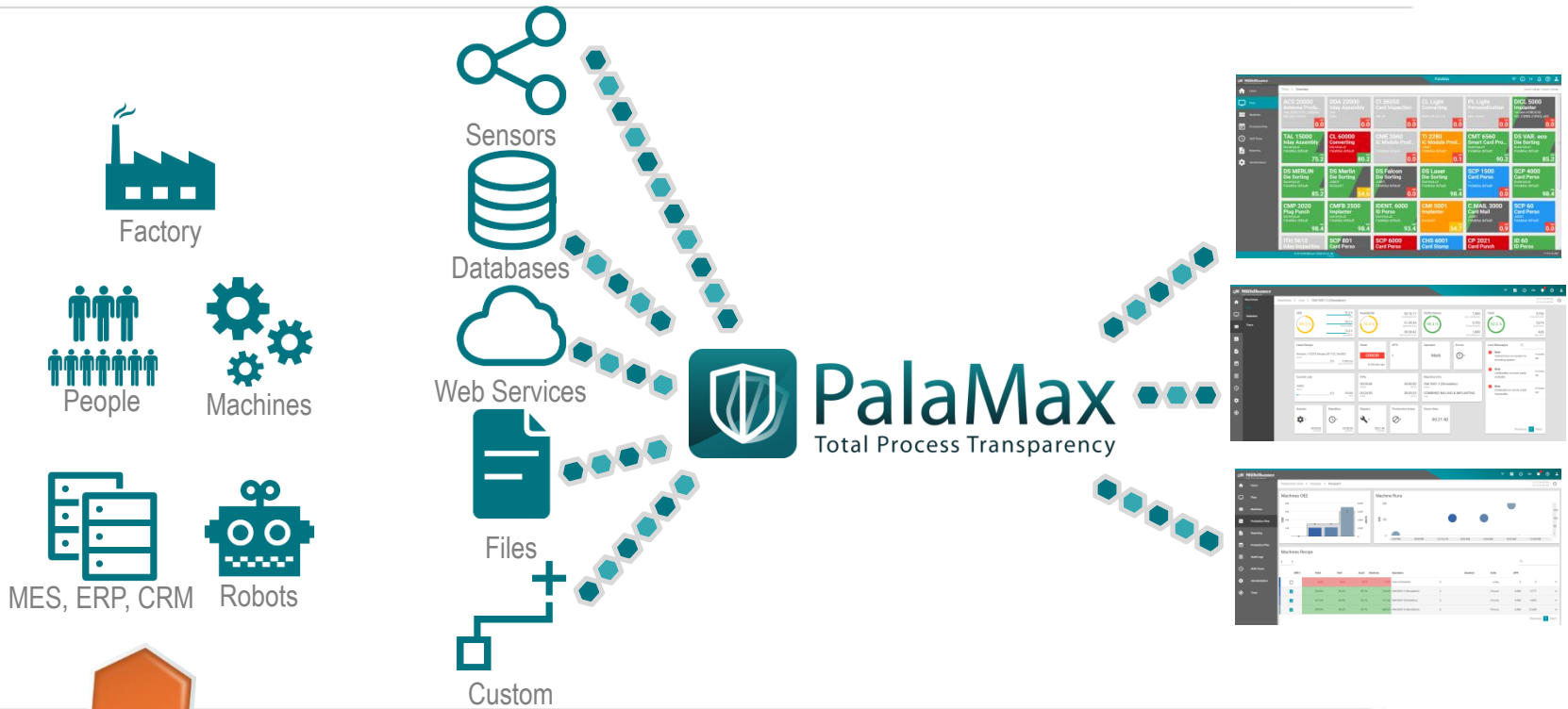- Centrally stored and secured audit trail of all user actions.

Factory

People   Machines

MES, ERP, CRM   Robots

Sensors

Databases

Web Services

Files

Custom

PalaMax
Total Process Transparency

PalaMax - Walkthrough

PalaMax – Modules

PalaMax.Monitor

PalaMax.Stats

PalaMax.Report

PalaMax.Remote

PalaMax.Maintain

PalaMax.Track&Trace

PalaMax.Recipe

PalaMax.Cost

PalaMax.Monitor

Monitors the real time performance of your machines on the shop floor, e.g. state of machine or metrics.

- Constant up-to-date & transparent overview of the production
- Allows immediate reaction on aberrations, saving Time and Money

PalaMax.Stats

Statistical tool to easily analyze historical data. Select your desired time interval and get customized statistics, e.g. OEE, yield, performance and availability.

- Enables trend analysis on a whole batch of details to get hints for performance optimizations
- Makes improvement effects comparable

PalaMax.Report

The reporting module tracks and documents the productivity

- Tailor-made reporting to display individual requirements
- Creation of custom reports
- Creation and upload of customized Microsoft Excel templates

PalaMax.Remote

Machines on the shop floor can be operated remotely from a control center. This first step of shop floor automation and significantly reduces staff requirements

- Direct access to all machines from one central place
- Significant time savings
- Improvement of staff effectiveness & security

PalaMax.Track&Trace

Trace your product through the entire production process.

- Allows the comparison of manufacturing runs between each other
- Detect and define reasons for production faults

PalaMax.Maintain

Manages the maintenance tasks on the shop floor. The aim is to switch a process from random stoppages to scheduled and preventive maintenance.

- Enables planning of production down times in a deterministic manner
- Supports the maintenance planning and execution to be more efficient

PalaMax.Cost

Collects process timings and allocates machine cost to generate unit cost.

- Enables profit from a tighter cost control
- Makes your production more profitable.

PalaMax.Recipe

Manages recipes and their versions, enables production engineering to prepare and test a **repeatable factory set up**. Factories can switch between products within a matter of minutes. PalaMax.Recipe can set up verification systems in a repeatable manner, providing comparable quality performance indicators.
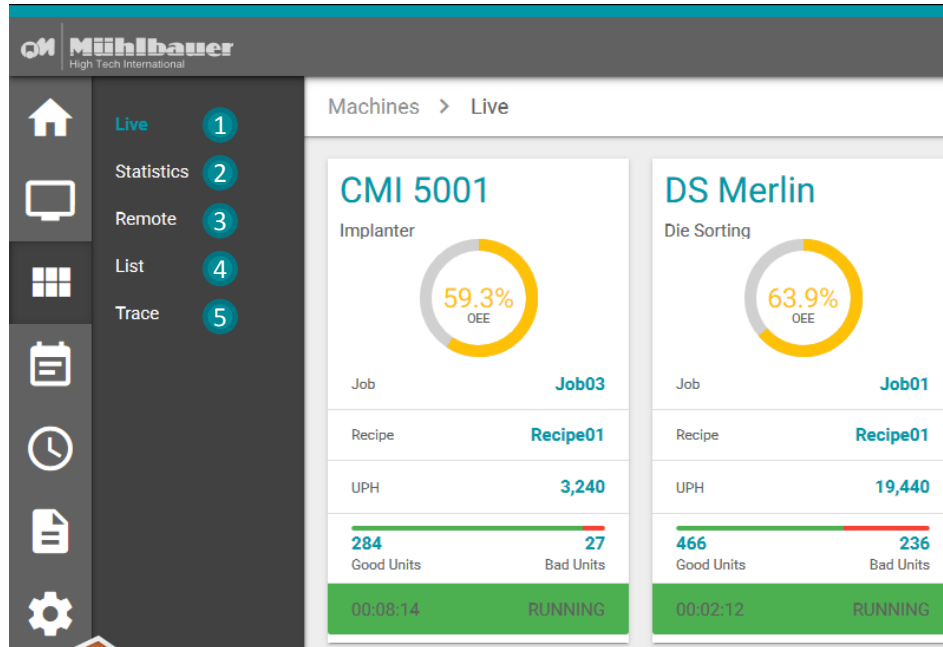
- Ensures the repeatability of produced and qualified qualities
- Makes production more comprehensible & specific

PalaMax – Walkthrough: Factory Overview

Factory Overview:

- Displays all connected machines in particular card features.

- Makes factory production data available in real-time.

- Instant Visibility: Compact state overview with Key Performance Indicators (KPI) such as:

    - OEE (Overall Equipment Effectiveness)

    - Yield

    - Performance

    - Availability

Menu – Machines:

(Filter for machines and time does apply)

1. Live: Displays real time information
2. Statistics: Displays historical data
3. Remote: Remote connection
4. List: Machine List
5. Trace: Visualization of reject reasons
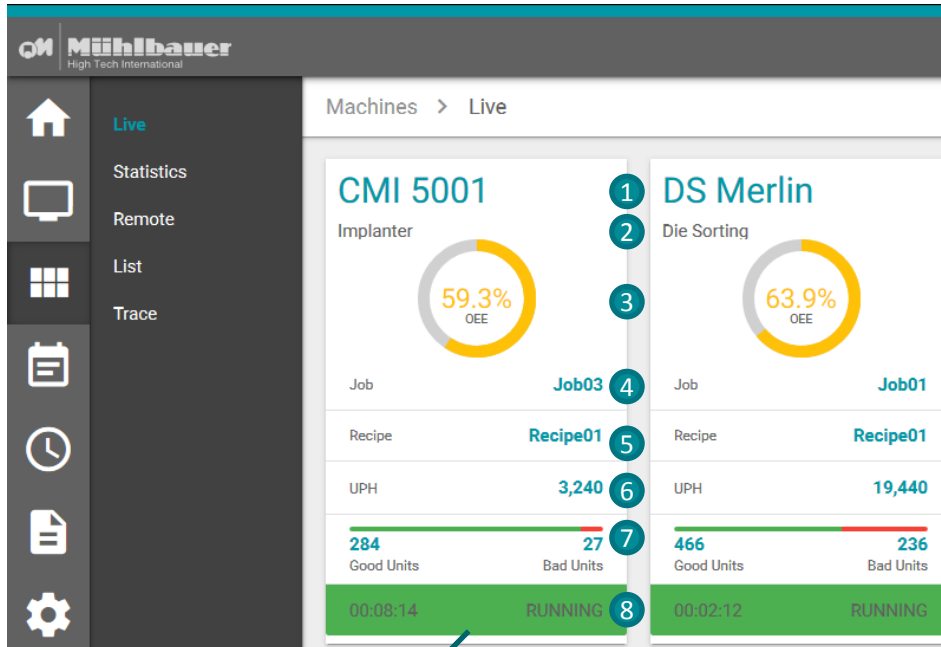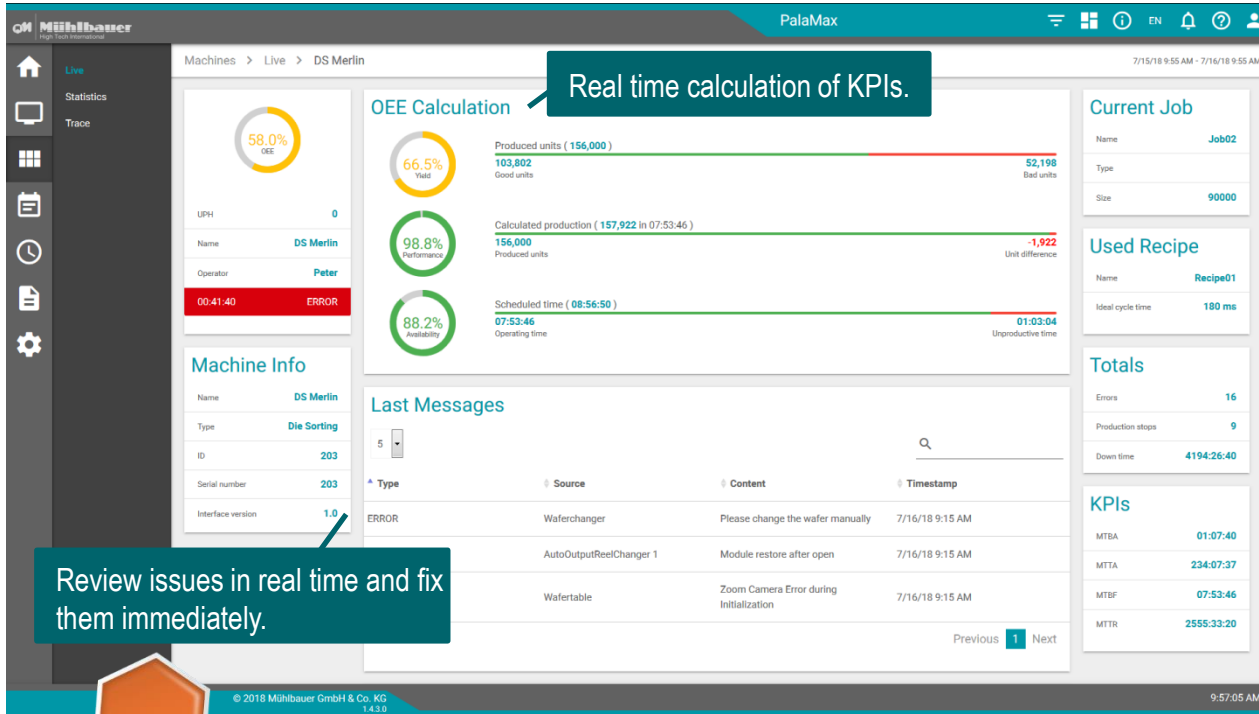
Real time factory monitoring.

Menu – Machines Live:

(Filter for machines and time does apply)

1. Machine name
2. Machine type
3. Visualization of selected KPI
4. Loaded Job
5. Loaded Recipe
6. Current Throughput / Units per Hour (UPH)
7. Ratio Good Units to Bad Units for last job
8. Machine state and state duration

Machine Live:

Get real time KPIs at a glance!

- OEE
- Yield: number of units coming out of a process/number of units going into the process
- Performance: compares actual time needed and what time was needed in the past, for the same product with the same machine
- Availability: equipment's functioning time vs. unproductive time
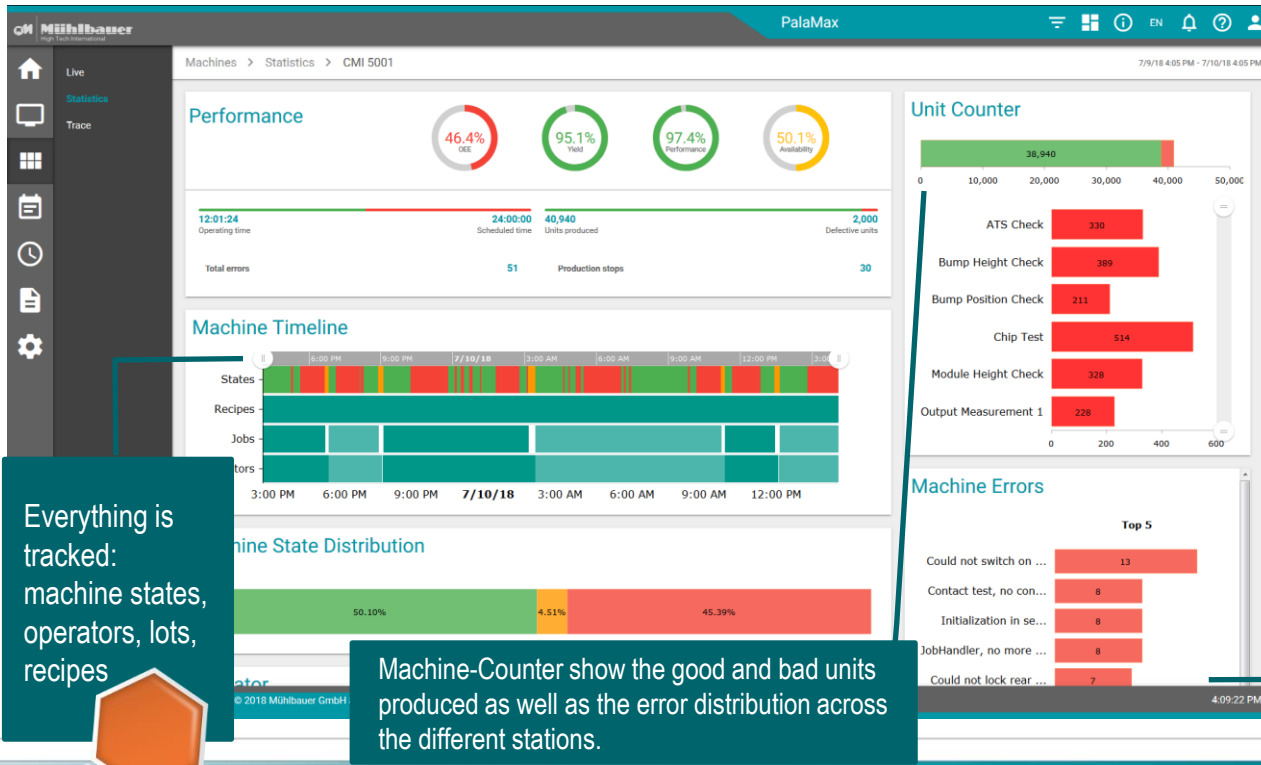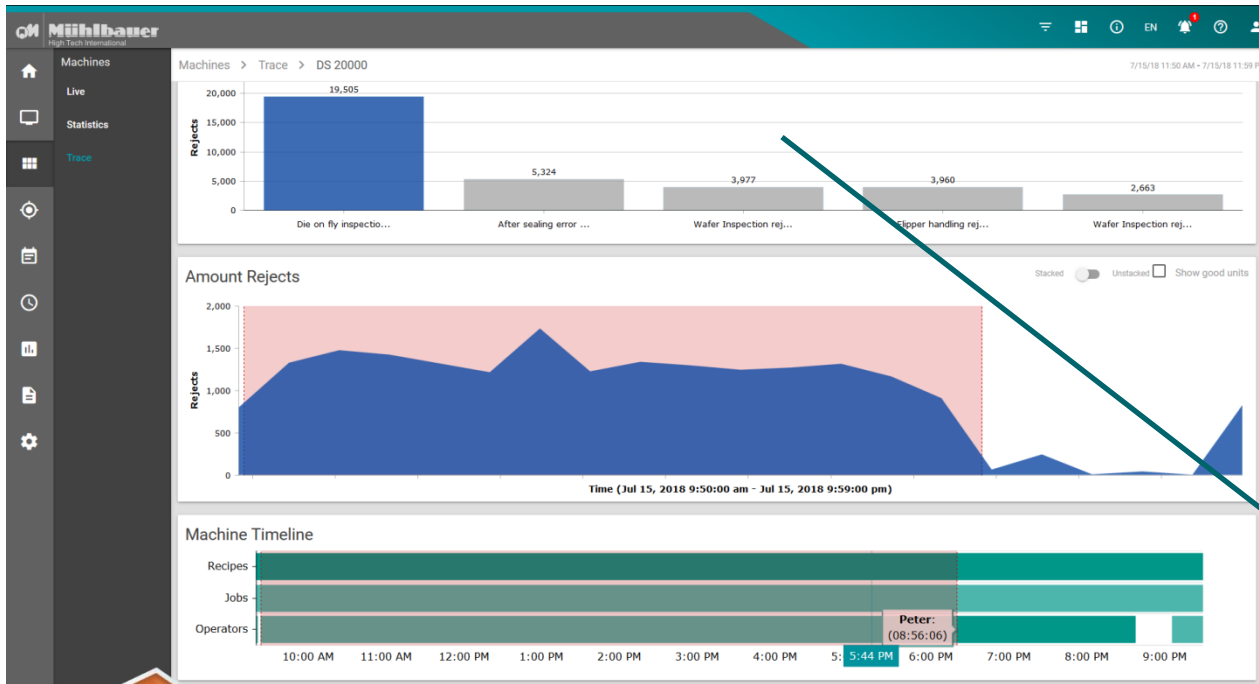
Machine Statistics:

Visualizes historical machine data:

- Performance Indicators (OEE, Yield, Performance, Availability)
- Timeline views of the machine states, loaded recipes respectively jobs and operators
- Unit counters for the whole machine as well as for each machine module
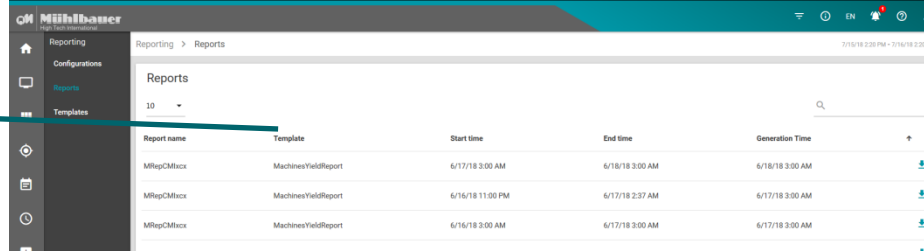- Machine errors

Everything is tracked: machine states, operators, lots, recipes

Machine-Counter show the good and bad units produced as well as the error distribution across the different stations.

View the error report and see the TOP 5 errors immediately.

PalaMax – Walkthrough: Machines Trace

Machine Trace:

- Detailed reporting tools
- Drill-down analysis
- Identify reject reasons and their root causes
- Improve production flow

View Top reject reasons and their distribution over time + machine time line including recipes, jobs and operators.

PalaMax – Walkthrough: Reporting

Reports are automatically distributed and sent by mail or available for later download.
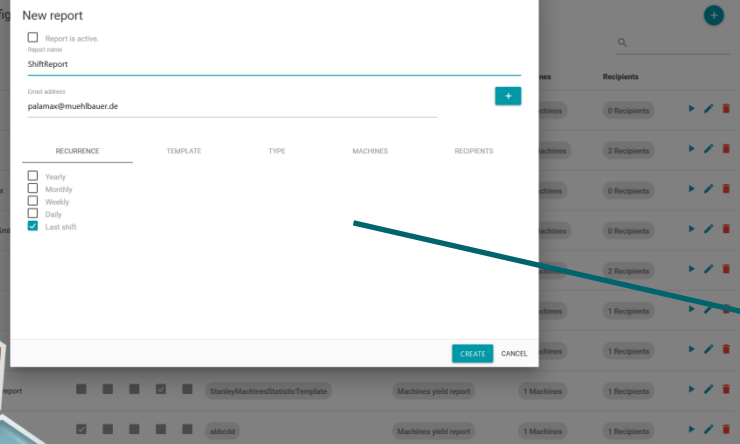
Create reports based on your requirements: your template, your machine selection, your defined time of creation.

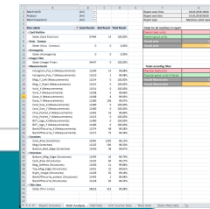**Stay informed with automatic generated reports and notifications:**

- Tailor reports to display what you want and need
- Create custom reports
- Create and upload your custom templates with Microsoft Excel
- Configure PalaMax with your schedules, notifications, alerts and recipients lists

PalaMax – Preventive Maintenance
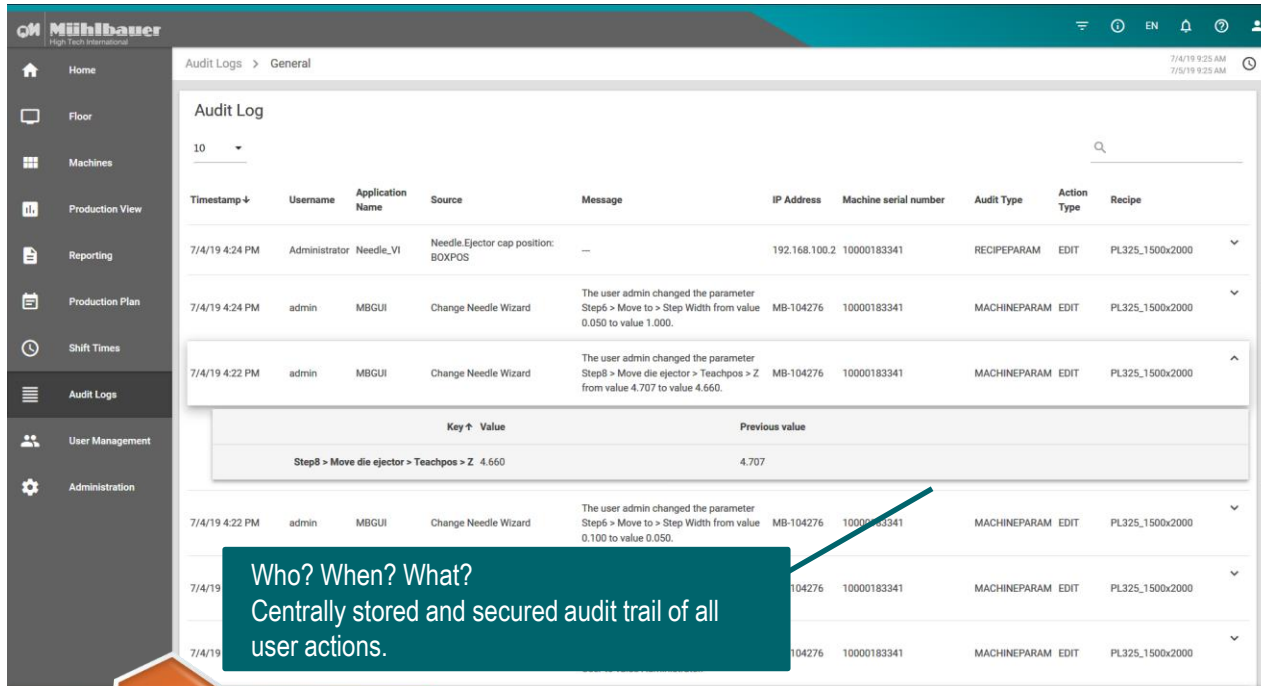
Preventive Maintenance:

Unplanned stoppages of the production may risk an agreed delivery time:

- Plan preventive scheduled maintenance more efficiently
- Save maintenance cost due to the precise determination of the actual need

Audit:

Document and audit user action from PalaMax and machines:

- Every single user action is recorded and stored, e.g.:
    - User Login/Logout
    - Parameter and Recipe changes
- Rich set of auditing capabilities according to Payment Card Industry Data Security Standard (PCI DSS)
- Complete, easy and central review of audit trails

10/9/2019

TRANSPARENCY OF YOUR PRODUCTION

Instant Visibility:

- Real time KPIs at a glance: Overall Equipment Effectiveness (OEE), Yield, Performance, Availability

- Visualization of all valuable machine data in real-time with interactive charts, graphs and more from any web-enabled device or PC and generate informative reports

- Gives managers the insight they need in order to improve operations while allowing the management to make better fact-based decisions

Return On Investment:

- Spot trends and identify opportunities for improvement when they happen due to real-time monitoring.

- Immediate intervention before major defects occur.

- Run your production with improved security and optimally employed staff

Security and Compliance:

- You are in full control of your data
- All data is stored locally on your own servers – forever
- Your data is safe on your IT infrastructure
- Compliance with ISO and PCI standards

Accessibility:

- Utilizes responsive web design
- Avoids expensive installation of Application Software on the individual device
- Accessible from any web enabled device

Securing your Future Competitiveness:

- New Business Models
- New Services

"Mühlbauer has done a great job! We have been dreaming about such a system for more than 10 years. It's definitely changing our way of seeing our production processes."

ams Sensors, Singapore

Semiconductor

CompoSecure, USA

Card Production

ForzaCard, Mexico

Card Production and Personalization
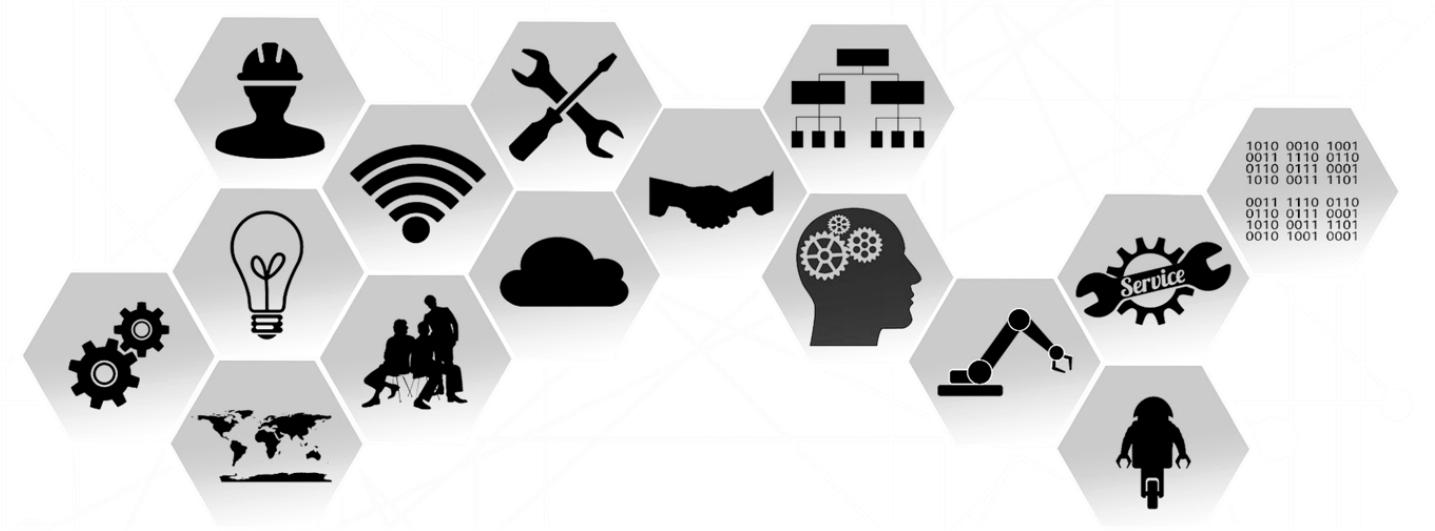
Medtronic, USA

Medical

ZCSTC, China

Security Document Production and Personalization

Summary – Smart Factory

Smart Factory touches all facets of a production and transforms the current way of manufacturing by increasing the level of automation. The intelligent use of the production data available combined with technological advances in factory automation facilitates meeting the customer's requirements for shorter turnaround times, local production with short manufacturing distances and cost savings.

we have **Domain Knowledge**

we use **Industry Standards**

we provide **everything from one hand**

we provide **support throughout the world**

Partnership

- Domain Knowledge
- Competence in hardware, electronics, software
- Everything from one hand
- Confidence of governments & public authorities worldwide
- Trust and reliability - our most important values
- Convincing by high speed, best quality & strict customer orientation
- Planning, risk management, effective monitoring & support
- Close partnerships with all stakeholders

**YOUR TRUST IS OUR GREATEST MOTIVATION TO
TURN EVERY CHALLENGE INTO A SUCCESS STORY.**

MÜHLBAUER GMBH & Co. KG
Josef-Mühlbauer-Platz 1
93426 Roding

Phone: +49 9461 952 0
Fax: +49 9461 952 1101
Mail: info@muehlbauer.de
Web: www.muehlbauer.de

Mühlbauer

High Tech International