

FROM MES TO DIGITIZED MANUFACTURING (INDUSTRY 4.0)

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Social and economic challenges



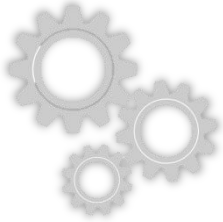
Smart Factory – the Fourth Industrial Revolution

**WHERE DO WE
COME FROM?**

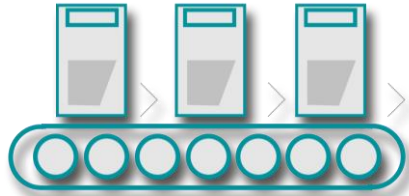


**WHERE DO
WE GO?**

Industrial Revolutions – 1800 till now



Mechanization



Electricity & Assembly Lines



Microelectronics & Computers



Digitalization & Connectivity

1800

INDUSTRY 1.0

Machines powered
by Water & Steam

Railway, Textile Mills

1900

INDUSTRY 2.0

Acceleration of
Working Processes

Telecommunication

1970

INDUSTRY 3.0

Automated
Production

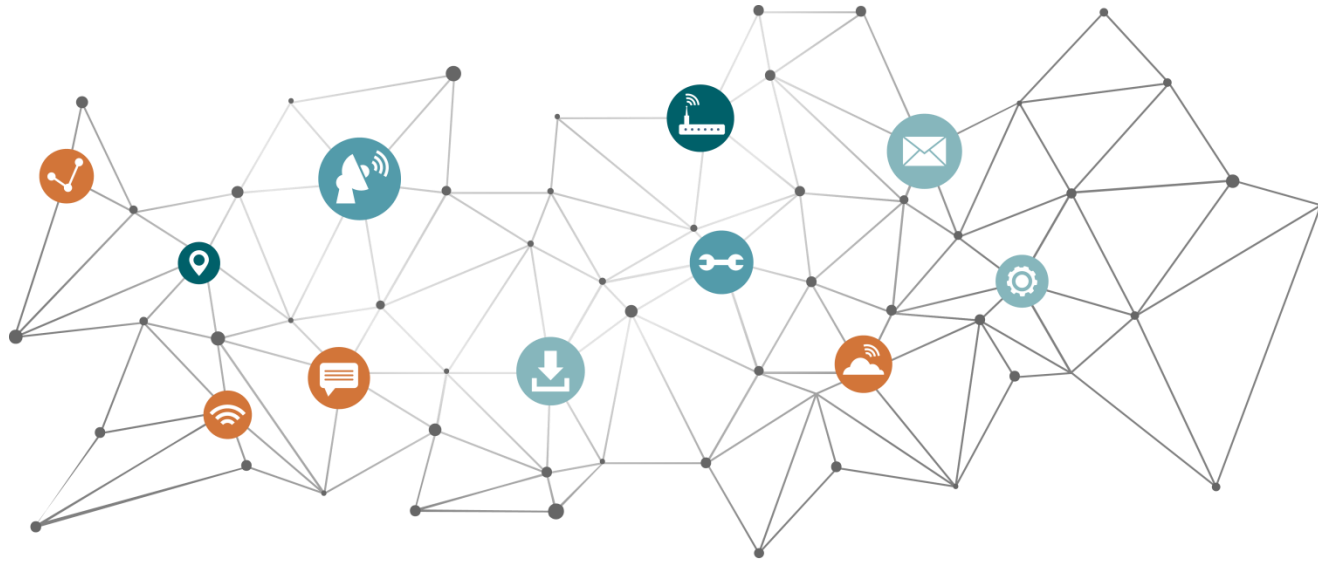
*Personal Computers, Mobile
Communication, Internet*

2000

INDUSTRY 4.0

Internet of
Things

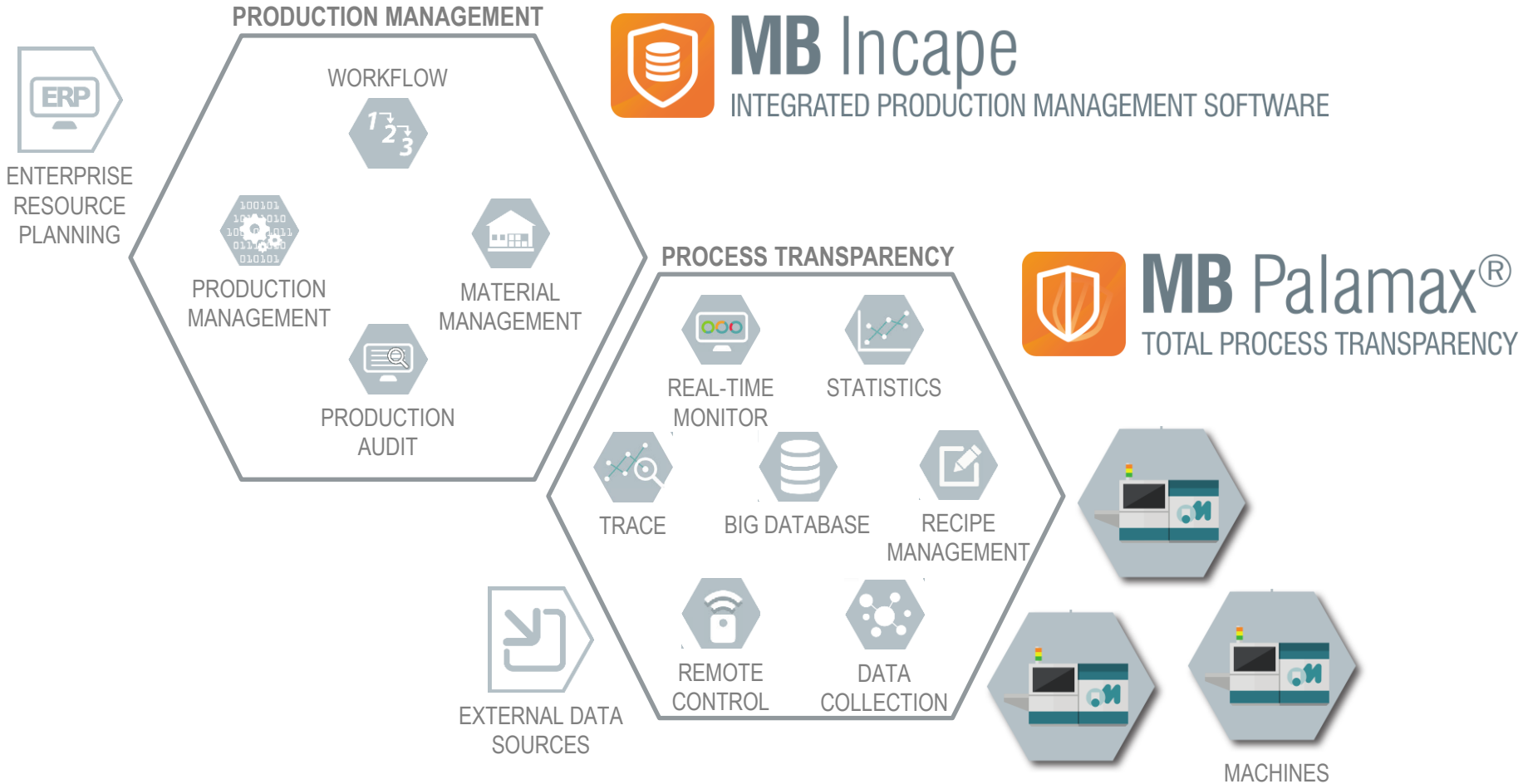
Everything becomes „Smart“



*“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 with bottom-line. The overall goals of Smart Factory are production benefits such as increased efficiency, higher transparency and reduced costs.

Smart Factory – Here we go ...



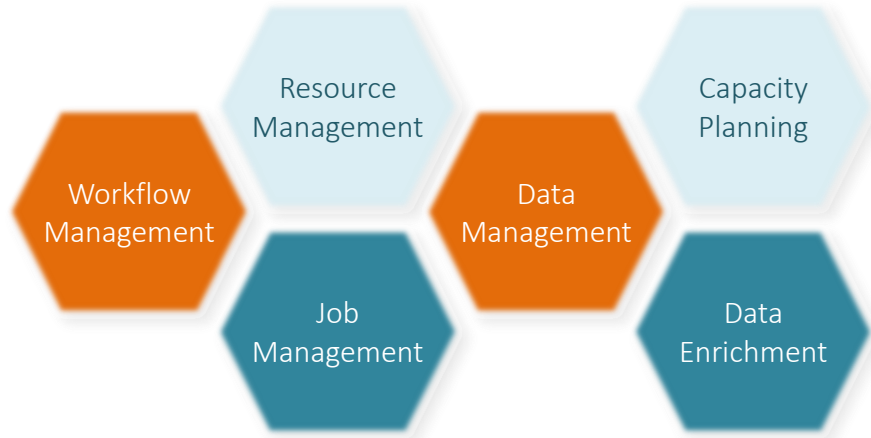
INCAPE



Smart Production Management

Fine-grained production management gives advantages like

- Full control of the work-flows,
- priority based manufacturing of orders



INCAPE – Workflow Management

INCAPE

Production
Management

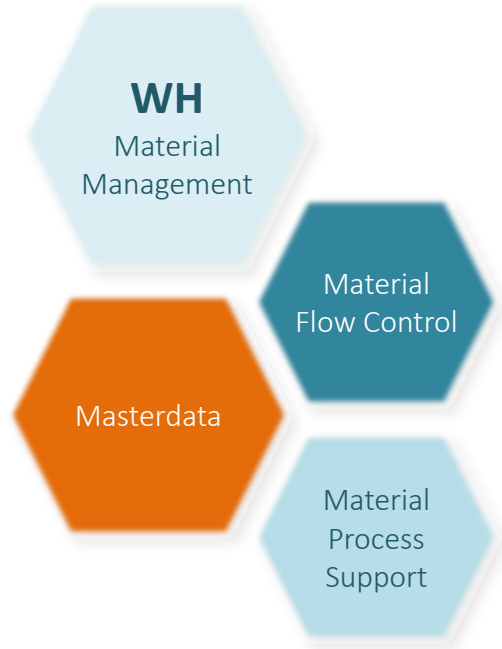


Consideration of production parameters

- Priority
- Deadlines
- Availability
- Throughput...



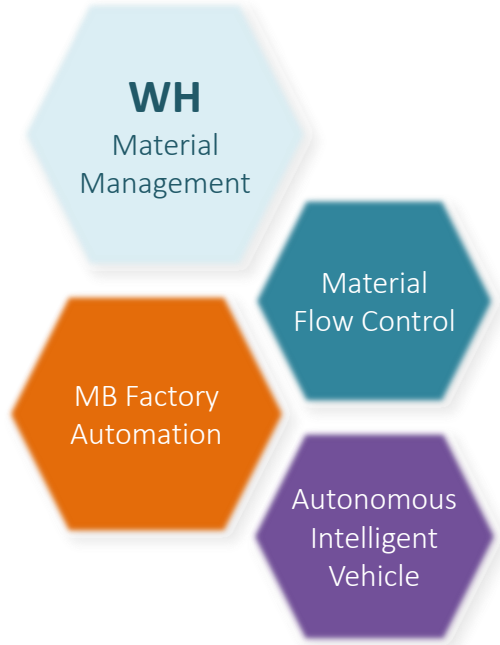
INCAPE – Warehouse



- **Manage Masterdata**
 - material types, locations, sites, suppliers, units, import/export
- **Material Flow Control**
 - material states , production steps
 - filters and search
 - purchase order, introduce, assign, move
 - material container support
 - rebooking rules
- **Demand Warning**
 - define stock limits and shows alerts if reached
- **Access documentation and tracking**
 - material trace to document any material handling
- **Reference Number Handling**
 - import external reference number lists
 - generate reference numbers by rule (random, sequence, check digit etc.)



INCAPE – Automatic Material Transport with AIVs



Autonomous Intelligent Vehicle: AIV moves freely on the production floor

- No need for any rails or guidings
- Self-taught, autonomous machines remember alternative routes (in case of stumbling upon any obstacles)
- Cooperate with human workers in a dynamic, changeable environment.
- Increase throughput
- Reduce machine idle time
- Eliminate errors
- Improve material traceability



PalaMax

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Production
Transparency



Full Production 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
- Integration of MB and 3rd Party equipment

Real-Time
Monitoring

Statistics

Recipe
Management

Track & Trace

Preventive
Maintenance

Report
Generation

Remote
Control



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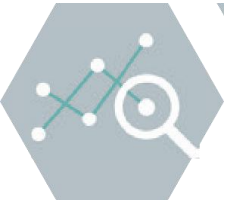
Production Transparency

- 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.



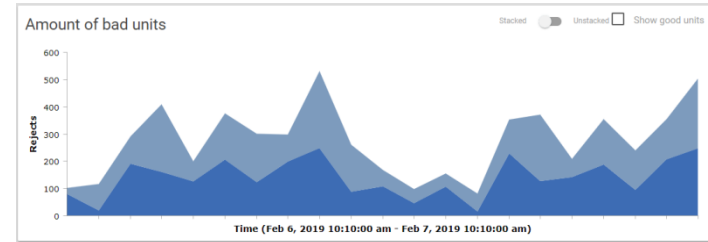
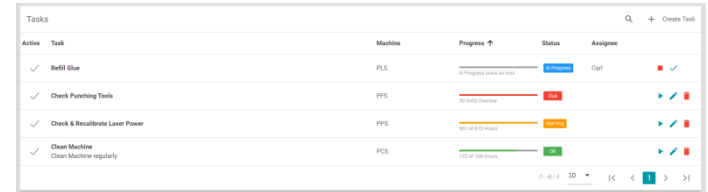
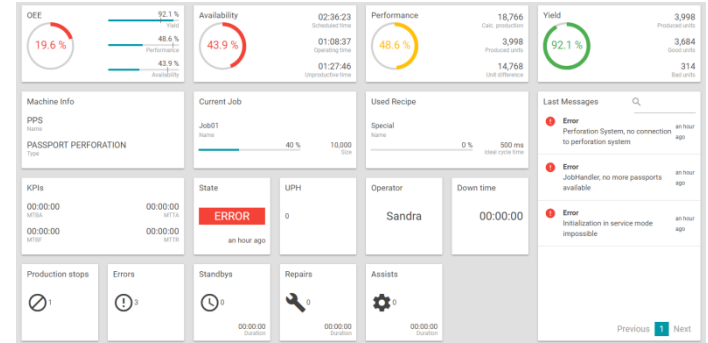
Preventive Maintenance

- 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

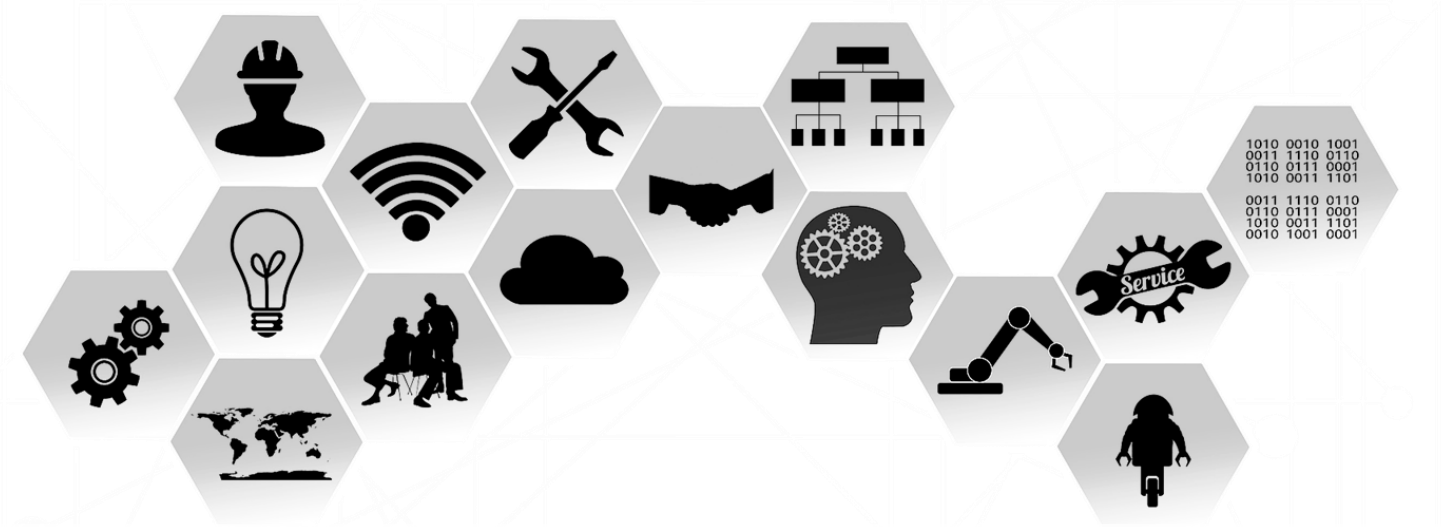


Track&Trace

- 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.



Summary – Smart Factory



Smart Factory touches all facets of a production and transforms the current way of card 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.

- 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.**



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