BOOSTING PRODUCTIVITY
WITH INDUSTRIAL IOT & AI
PREVIOUS INDUSTRIAL REVOLUTIONS FUELED BIG GROWTH

STEAM ENGINE  MASS PRODUCTION  IT & AUTOMATION
THE 4TH INDUSTRIAL REVOLUTION IS EXPECTED TO BRING MASSIVE PRODUCTIVITY BOOM
IF YOU ALWAYS DO WHAT YOU’VE ALWAYS DONE, YOU’LL ALWAYS GET WHAT YOU’VE ALWAYS GOTTEN.

~Henry Ford
THE WINNERS ARE THE ONES BEATING TODAY’S MANUFACTURING CHALLENGES EARLY ON...

- LACK OF VISIBILITY
- UNPLANNED DOWNTIME
- PRODUCTION QUALITY
- PRODUCTION WASTE
...as they understand the business value
real-time & AI-powered insights create

Productivity gains
Increased OEE
Cost savings
OUR APPROACH IS SIMPLE: WE FIND OUT WHAT HAPPENS, WHY IT HAPPENS AND WHAT WILL HAPPEN

WHAT IS HAPPENING
We connect, harness, and monitor real-time data

WHY IS IT HAPPENING
We detect anomalies and bottlenecks in production, maintenance and inventory

WHAT WILL HAPPEN
We create predictions to determine patterns and trends that could potentially predict future outcomes.
WE START BY COLLECTING DATA FROM ALL RELEVANT SOURCES

Data sources
- HMI-Scada
- PLC
- ERP, SCM, PLM
- MES, MoM
- Other data (files)
NEXT, WE INTEGRATE THE COLLECTED DATA INTO A VIRTUAL DATA LAKE AND APPLY ML

**Data sources**
- HMI-Scada
- PLC
- ERP, SCM, PLM
- MES, MoM
- Other data (files)

**Data connectors**
- Out of box connectors supporting various standard interfaces (opc, jdbc, http, csv, xml, xls, json...)

**Data modelling**
- Data integration, storage, logic

**Data integration layer**
- Data integration, storage, logic

**Data analytics modelling**
- Descriptive/predictive analytics, anomaly detection

**INSIGHTS LAYER**

**Data modelling**
- Enriches data with digital twin technology
Data sources
- HMI-Scada
- PLC
- ERP, SCM, PLM
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Data analytics modelling
- Descriptive/predictive analytics, anomaly detection

User interface layer
- Conveys information to user interfaces, BI tools, Excel, SAP etc.

Applications layer
- Role based views
- 3D visualizations
- Analytics dashboards

INSIGHTS

ACTIONS

THEN, WE MAKE THE REAL-TIME INSIGHTS AVAILABLE FOR BETTER & FASTER DECISIONS
BUT, WHATEVER YOUR GOALS ARE, SUCCESSFUL APPROACH STARTS WITH BUSINESS UNDERSTANDING

DEFINE
Define the business results you want to achieve and initial questions to solve

CONNECT & COLLECT
Connect to all available sources and collect relevant data

ANALYZE
Select the right analytics approach to align with your overall goals

VISUALIZE
Real-time data visualization for transparency and proactive decision-making

IMPLEMENT
Introduce process innovation and develop employee digital skills while introducing new solutions
SMART FACTORY IS NOT A DESTINATION, IT IS A JOURNEY.
YOU’LL SEE THE FIRST CONCRETE RESULTS IN JUST 12 WEEKS.
The Challenge

• As the use of data exploded 2008-2009, our corporate customers suffered from unplanned network and service failures
• Mostly, it was our customers who noticed the failures first and notified us
• Problem solving was manual and could take anywhere from a few hours to several days

The Solution

• First phase: Automatic 24/7 monitoring of network services to enable proactive customer problem solving
• Second phase: By analyzing history and real-time data, we started detecting anomalies and patterns that indicated possible future failures
• We built (and continue building) algorithms that predict incidents before they occur

The Results

• The number of network/service incidents has dropped by >70% since 2011
• Today, we prevent >80% of incidents from occurring with predictive analytics
• The detected incidents are solved mostly automatically by robots, the rest manually
• Customer satisfaction has increased significantly
 ALSO, WE HAVE EXTENSIVE EXPERIENCE IN OPTIMIZING MANUFACTURING OPERATIONS

PURPOSE BUILT
for discrete and process manufacturing

END2END OPTIMIZATION
of all manufacturing processes

PIONEERING TECHNOLOGY
working across platforms, systems and machines

12 WEEK DELIVERY
from data connections to real-time insights
3D DIGITAL FACTORY
CUSTOMER EXAMPLES
P&G IS DETECTING, SOLVING AND PREVENTING ISSUES FASTER

P&G is an American multinational consumer goods company

The challenge
• Production loss due to lack of cross-departmental visibility into real-time material availability

The Solution
• Real-time, role-based views for monitoring key KPIs and material availability across departments
• Dashboards for management, departments, line managers/operators, inbound/outbound

The Benefits
• Ability to detect, solve and prevent issues faster
• Increased machine uptime
• Improved inventory flexibility
• Overall increased operations efficiency
METSÄ WOOD HAS E2E VISIBILITY TO ALL PRODUCTION STAGES

Metsä Wood is a producer of veneer, plywood, timber products

The challenge

• No visibility to material availability in intermediate storages or machine condition – high unplanned downtime

The Solution

• 3D Digital Factory to provide E2E visibility to all production stages, intermediate storages and logistics between two sites
• Real-time, continuous productivity performance KPI calculations from sources like ERP and MES

The Benefits

• E2E insights brought into one view – no need to look at multiple programs and displays
• Ability to react fast to problems with real-time visibility to intermediate storages
• Better decision-making based on real-time data
• Increased machine uptime
e.GO MOBILE HAS INCREASED OPERATIONS EFFICIENCY

e.GO Mobile AG is a German electric car startup company

The challenge
• Lack of internal production transparency
• Slowness in reacting to increasing customer requests

The Solution
• 3D Digital Factory providing real-time visibility to all production stages (material availability, bottlenecks, machine conditions etc)

The Benefits
• Ability to detect, solve and prevent issues faster
• Better insight to material demand
• Ability to make shop-floor adjustments on the fly
• Overall increased operations efficiency
A TECH COMPANY IS STEADILY INCREASING MACHINE UPTIME

A global technology company supplying systems for passenger cars and commercial vehicles

The challenges

• Monitoring based on historic, manually collected data reports (people, machines, systems)
• No real-time visibility to machine availability/maintenance status

The Solution

• 3D visualization of maintenance status and history for machines and open tickets
• Connectivity to multiple data sources and systems

The Benefits

• Reduced manual efforts
• Improved machine uptime
• Improved quality
NVISION CAN REACT FASTER THANKS TO ANOMALY DETECTION

Nvision is a software solutions, support and managed services provider, as well as electronic manufacturer.

The challenges

- Unstable production quality when new batches started
- High waste of components
- Low OEE

The Solution

- Anomaly detection
- Real-time alerts to users when errors detected
- 3D visualization of SMT lines
- Dashboards to help monitoring KPIs in real-time

The Benefits

- Faster reaction time to identified bottlenecks
- Increased machine uptime
- Increased overall efficiencies
Danfoss manufactures products used in cooling food, air conditioning, heating buildings, and powering mobile machinery.

**The challenges**
- Unstable production quality when new batches started
- High waste of components
- Low OEE

**The Solution**
- Connection to automation system to start data collection from various data sources
- 3D visualization of SMT lines
- Dashboards to help monitoring KPIs in real-time

**The Benefits**
- Faster reaction time to identified bottlenecks
- Improved quality
- Increased OEE
A GLOBAL PHARMA COMPANY IS INCREASING YIELD

A multinational healthcare company, manufacturing pharmaceutical products and services

The challenges

- Low yield
- High operational costs
- Slow ability to detect outliers in production

The Solution

- Anomaly detection to understand which anomalies affected the success of the batch
- Yield level prediction for the ongoing batch runs

The Benefits

- Optimization of the bioreactor process to maximize yield
- Resource savings in process monitoring and detection of more complex anomalies
VEIKKAUS DISCOVERED EMPLOYEE TRAINING DEVELOPMENT NEED

Veikkaus is an operator of over 20 000 gambling game machines

The challenge
• Lost revenue due to high unplanned downtime of machines

The Solution
• Integration of data sets from multiple source systems to cover all the assumed potential indicators of breaks
• Multiple modeling methodologies used to construct predictive model of maintenance need

The Benefits
• Against all assumptions, the models proved that both HW and SW aspects were not causing the downtime. The single largest reason was inconsistent quality of maintenance work done for the machines.
• Based on the findings, the company developed an action plan to increase training of the maintenance personnel that had been servicing the affected machines
eLab INCREASED PRODUCTION YIELD BY OVER 15%

eLab is an Industry 4.0 research center producing lithium-ion battery cells for automotive industry

The challenges
• Unstable production quality with high scrap rates
• Time-consuming, trial and error -based approach to improve efficiency

The Solution
• Integration of OT-environment into a data lake
• Predictive quality analytics to understand which data patterns affect the battery cell quality

The Benefits
• Scrap rate reduction by 15-19%
• Reduced ramp-up times 10-15%
Thank you!

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