There will be NO Smart Factories without SMART MACHINES

Martin Walder – VP Industry, Schneider Electric
Megatrends are provoking a rise in demand for energy and automation.
Our challenge in the next 40 years

- x1.5 ENERGY CONSUMPTION
- ÷2 CO₂ EMISSIONS NEED TO BE HALVED
- 3x WE HAVE TO BECOME 3 TIMES MORE EFFICIENT

Note: Forecast for 2050 compared to 2009 levels
Cost reduction / ROI
The digital plant of the future must address key customer imperatives
Don’t get scared off by the ‘big’ talk

To get started - it’s less about the whole: - Ind 4.0 or IIoT or Smart Factory…..

Think more about practical steps for delivering value…..

Operational Efficiency  Empowered Operators  Business Agility
The Digital Transformation
Driving productivity & profitability

Operational Efficiency
Leveraging IT & OT technologies to make every asset autonomous & optimal

Empowered Operators
Using mobility & data analytics to make operators more productive

Business Agility
Utilising Smart connected products to make accurate and effective business decisions

*Source: Accenture, Winning with the Industrial Internet of Things
Smart Machines – The Building Blocks of a Smart Factory

Smart Machines Now are the building blocks of the Smart Factory of the Future

**Requires:-**
- Forward looking machine builder
- Machine Builder & User collaboration
- Combined Capex-Opex ROI assessment

**Allows:-**
- Remote monitoring
- Predictive / CBM
- Wider range of products
- Shorter product changeovers
- More energy efficient
- AI – Machine learning
- Pay per use
The good news is these solutions are here and now..

• Not just design concepts
• All these examples are real… manufacturers are already reaping the benefits
Practical examples using enabling technologies

- **CONNECTIVITY**
- **MOBILITY**
- **CLOUD**
- **ANALYTICS**

**IMPROVE THE USE OF YOUR RESOURCES**
**BE MORE AGILE AND MAKE DECISIONS FASTER**
**CREATE NEW DIGITAL OPPORTUNITIES**
Practical examples
IOT Sensor Solution

A complete solution

Sensors → Interface → Cloud → Application

1st step: Electromechanical sensors

- Limit switches
- Pressure switches
- Safety switches

Working as an interface between the sensor and the cloud. Communication done in Low Power Wan

Focused on Operated Network:

- SIGFOX

The first company already present to provide an IOT network

Watch information

be informed when Event happened or Check status of one sensor
Self diagnosing and web enabled variable frequency drives
Get Smart
Invest in smart devices integrated into smart machines to improve performance and availability…

Smart devices with:-

• Dynamic QR code diagnostics
• Embedded web servers
• Bluetooth and apps
• True energy metering
• Achillies 2.0 cyber security
Augmented Reality for Operation & Maintenance
EcoStruxure Augmented Operator Advisor
Superimpose real-time data and virtual objects on reality

**Reduce downtime**

Avoid unnecessary and costly machine downtime with the ability to open the electrical cabinet doors virtually.

**Speed up maintenance**

Find information faster with immediate, relevant access in the field (user manuals, instructions, diagrams, etc.).

“At present, 50% of time spent on maintenance involves finding information, with the remaining 50% devoted to actual intervention on the equipment”

Empowered Operators
Smart Machines

Allow New business models to benefit OEMs and Users

Tracking – Monitoring - Fixing
Potential **Tracking** services - repository based to access full machine history: from bill of material to localization and servicing / maintenance log, warranty info, and spare part availability.
How could I use Tracking capability?

To access key information about my machine

Web application
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2. Machine info tracking
   - Architecture
   - Machine and components documentation
   - Servicing logbook
   - Localization of my installed base
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   - To know the warranty status of the machine and its components
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4. **Spare part management**
   - Spare part availability information
   - Easy order placement
     (For SE components only)
Potential **Monitoring** services - cloud based for remote access - asset health and machine performance data (KPIs, dashboards), proactive alerts and expert access
How could I use Monitoring capability?

To access via a dashboard insights on my machine.

- Machine Raw Data
- Web application
- Remote expertise
- Real time information
- Programmed notifications (threshold breach)
- Advanced analysis to interpret data (raw or processed by analytics) and reports
- Analytics on machine condition analysis (health, performance, efficiency...)

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**FLEET OVERVIEW**

- Total assets: 2
- Total machines: 6
- Online machines: 5
- Offline machines: 1
- Machine breakdowns: 2
- Machine errors: 1

**OVERALL EQUIPMENT EFFECTIVENESS (OEE)**

- OEE: 0%
- OEE TRENDS: (Graph showing trend)

**AVAILABILITY**

- Availability: 100%
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Potential Fix service to facilitate maintenance operations with the help of step-by-step procedures and remote experts leveraging augmented reality.
How could I use a Fix capability?

Mobile App in Augmented Reality

To access insights about a machine and maintenance help
How could I use a Fix capability?

<table>
<thead>
<tr>
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How could I use a Fix capability?

1. Mobile App in Augmented Reality
   To access insights about a machine and maintenance help

2. Maintenance insights
   Step-by-step procedures (displayed via the app)

3. Remote Maintenance Services
   Over-the-shoulder expert assistance
   Remote troubleshooting
### Value proposition to OEMs and Users

#### Benefits for OEM
- Access to **machine information** anytime, anywhere
- Improved **customer satisfaction** through better, faster service
- **Differentiation** by offering **new services** with my machines
- Opportunity to **sell innovative services**
- Ability to identify machine **design improvements**

#### Benefits for User
- **Capex to Opex** business models
- **Better integrated** supply chains
- Faster **service**, reduced **machine downtimes**, improved **performance**
- **Better tracing** of operations
- Access to **expertise easily**
- **Anticipated maintenance** operations and improved maintenance **quality**
Examples
SOMIC provide the **fastest and most compact** machines for packaging coffee capsules.

### Customer challenge
- Most compact and quickest solution
- Output of 120+ folding boxes per minute
- Hi uptime – preventative maintenance
- Customer self help – minimum MTTR
- Best in-class maintenance
- Continuous Optimisation
An innovative OEM building micro power plants that generate power and heat using various types of readily available waste or biomass

Customer Challenge
- Easy remote control of worldwide plants
- Monitoring and analytics for optimal performance against energy and sustainability goals
- A model to buy energy not the machine

The Results
reliable energy supply

“Thanks to our partnership with Schneider Electric, we can grow and still remain a lean company focused on research and development.”

Julien Uhlig
CEO
Entrade

Apps, analytics, and services
- Wonderware System Platform
- EcoStruxure™ Resource Advisor

Edge control
- StruxureWare Automation Server
- PacDrive LMC Eco, Modicon M241

Connected products
- Altivar Machine
- Magelis HMI
Smart Factory

Smart Machine

Plant

Machine

Power

Building

Data Center