Digitalization, Automation, 4th Industrial Revolution

Nokia Conscious Factory

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- Personnel ~ 500
- Production floor ~ 16k m² (Oulu site ~ 75k m²)
- 6 SMD lines, 35 million component placement capacity in a week
- 8-10 new products ramp-up & transfers annually
- **Automation index 71%**

- 100% use of renewable energy
- 100% waste utilization rate
- 70% recycling/re-use rate
- WWF Green Office certified
- 1490 Kaizens implemented
- ~ 600 SMT boards
As a manufacturer Nokia is facing exactly the same challenges as any manufacturing companies,…

**Challenges**

- Improve productivity and safety along entire value creation process
- Maximize uptime to minimize business interruption
- Improve competitiveness by being more customer centric across all operations
- Increase flexibility and agility to quickly change production lines and introduce new products
- Increase level of automation to gain efficiency
- Reduce carbon emissions and energy consumption according to Horizon 2020

**Enablers**

- Sensors, actuators, valves, gateways to gather all kind of data
- Carrier grade technology to meet manufacturing requirements from ultra low latency to extended battery lifetime
- Device management and data collection platform
- Edge processing capabilities distributed along the entire network infrastructure to meet latency requirements and relieve networks
- Self learning, artificial intelligence to understand health status of assets and root causes
- AR / VR for training and simulations
... hence, we are building the factory of the future in Oulu and Chennai to achieve our goal in becoming best in class manufacturer in our industry

Our factories act as a live lab to test the use cases and proof of concepts for our customers benefit

Own live lab

We use our latest technology such as private LTE, 5G, IoT and Multi-Access Edge computing at our factories

Latest technology

Kaizen Award for the best Continuous Improvement System 2017, Lean Project Award for improved productivity and reduced lead times in 2016, Quality award in 2015

Award winning factories
4th industrial revolution already happening at Nokia’s Conscious Factory – enabling customer centricity through full automation and flexibility

Deployed Use Cases

Future Use Cases

Result: +27% productivity

*MES: Manufacturing execution system

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Nordic Industrial Efficiency Conference
Nokia Conscious Factory of the future is available already today

- CNC
- Filter Auto-tuning
- Latest generation SMT

- SPI & next generation 3D AOI
- Dream Cell concept
- 3D printing

- Modular Automation line Concept
- Multiscrew feeding & fixing
- Standalone production automation

- VR / AR utilization
- Autonomous vehicle
- Intelligent SMT material flow

- Video Analytics
- 5G OTA
- Conscious warehouse

- Digital Twin
- Conscious Factory

2014 2015 2016 2017 2018
Building Blocks of Conscious Factory - everything already available and ready for 5G connectivity
To build conscious factory many new innovations are needed:

• networked equipment to support automation, remote monitoring and predictive maintenance applications
• Diverse devices that communicate with, and control, other objects
• Digital supply chains for higher efficiency and lower costs
• Digital production/facility operations for high agility

Technologies such as
• 5G,
• Private LTE,
• The Internet of Things (IoT),
• cloud and intelligent software (ML/AI) …

will empower digital manufacturing to become more responsive, productive and efficient… conscious factories

Nokia conscious factory solutions and wireless connectivity can help manufacturing industry to transform the business for improved efficiency and increased business value
Go Allwhere

Networking solutions for the new age of industry

www.nokia.com/networks/go-allwhere