



Sustainable manufacturing - current developments and future opportunities

5.3.2020, Harri Nieminen

INTELLIGENT FACTORY AUTOMATION SOLUTIONS AROUND CUTTING MACHINE TOOLS

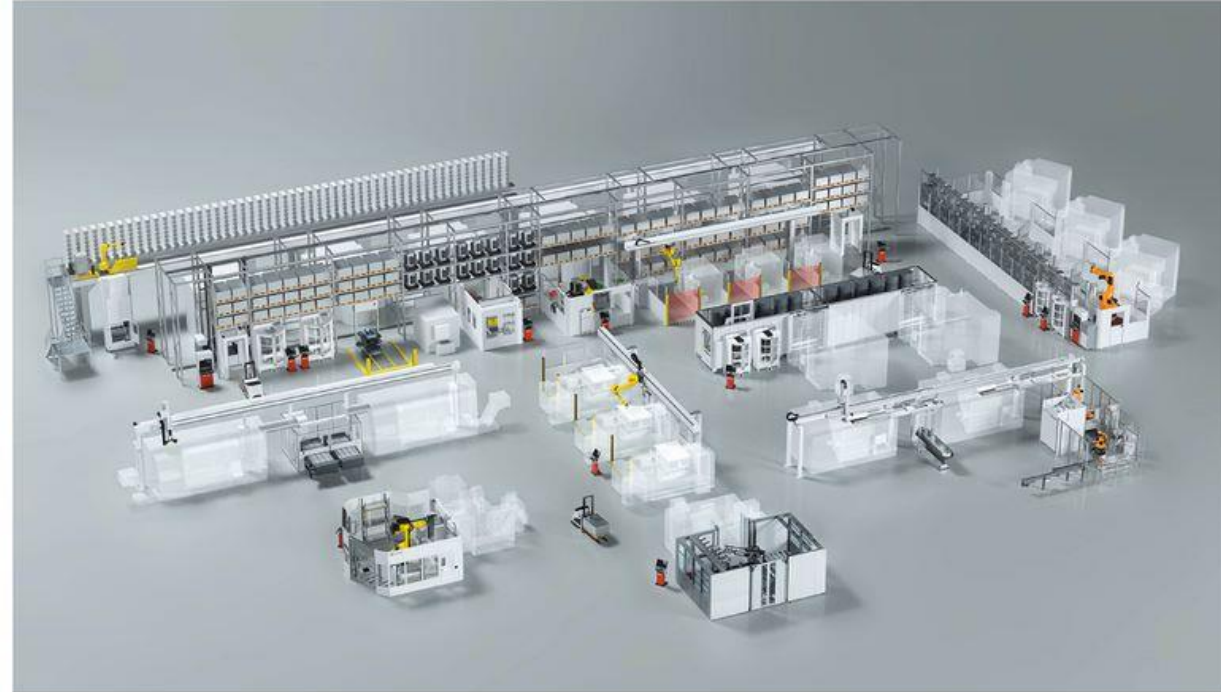


Key Facts

- 90M revenue
- 450 employees
- Founded 1901, family-owned
- 4000+ installed systems
- Main markets in Europe, North America and Asia

Why we exist?

Fastems aims for a world where manufacturing is a cornerstone of prospering nations, providing sustainable well-being.



Industries we work with?

- Aerospace
- Production technology
- Automotive
- Subcontractors (Job shops)

What we supply?

- Industry leading manufacturing management software
- Flexible manufacturing systems (FMS) and robotic automation
- Services

What makes us unique?

- Industry leading manufacturing management software
- The ability to integrate together any machine tools in the world
- Wide range of offering from modular systems to large advanced solutions
- Decades of automation experience

Impact potential



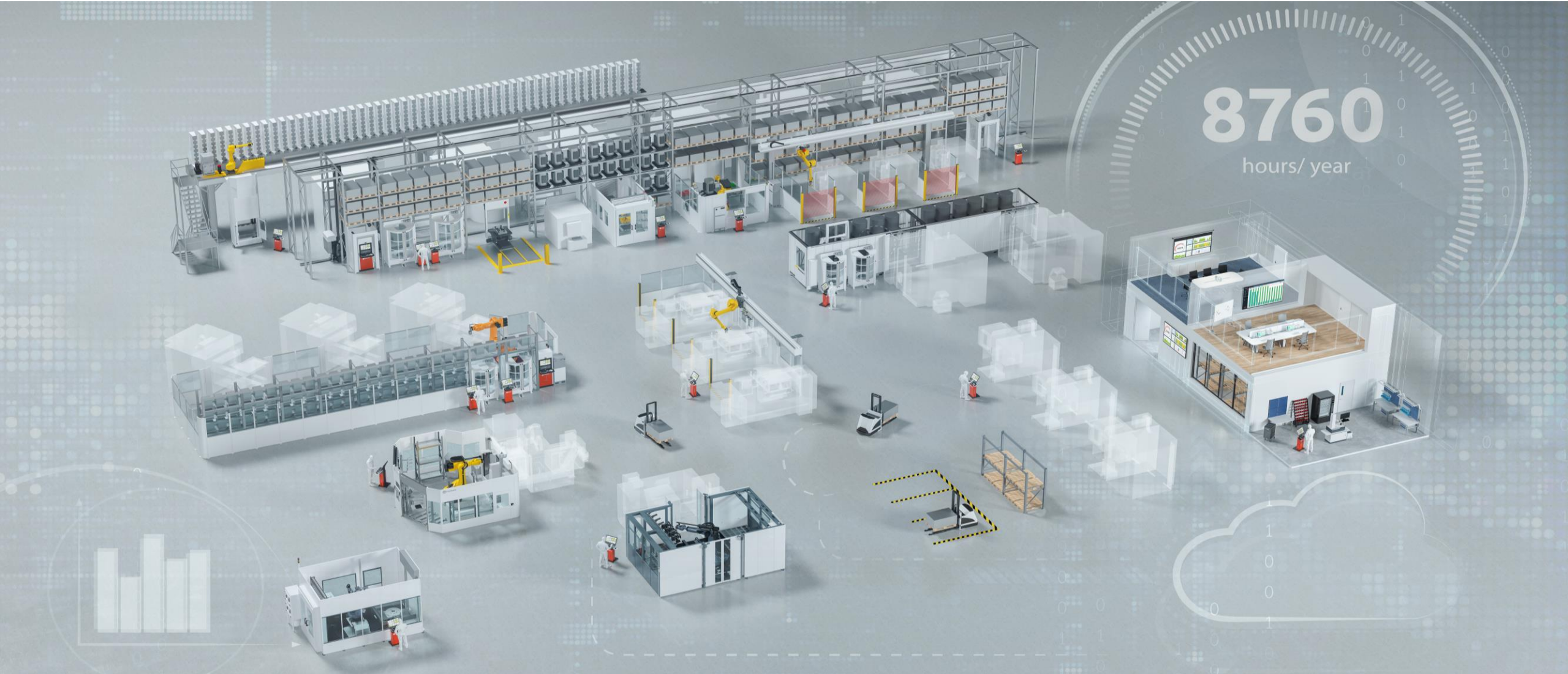
**Sustainability we enable for
others by developing and
deploying sustainable
solutions**



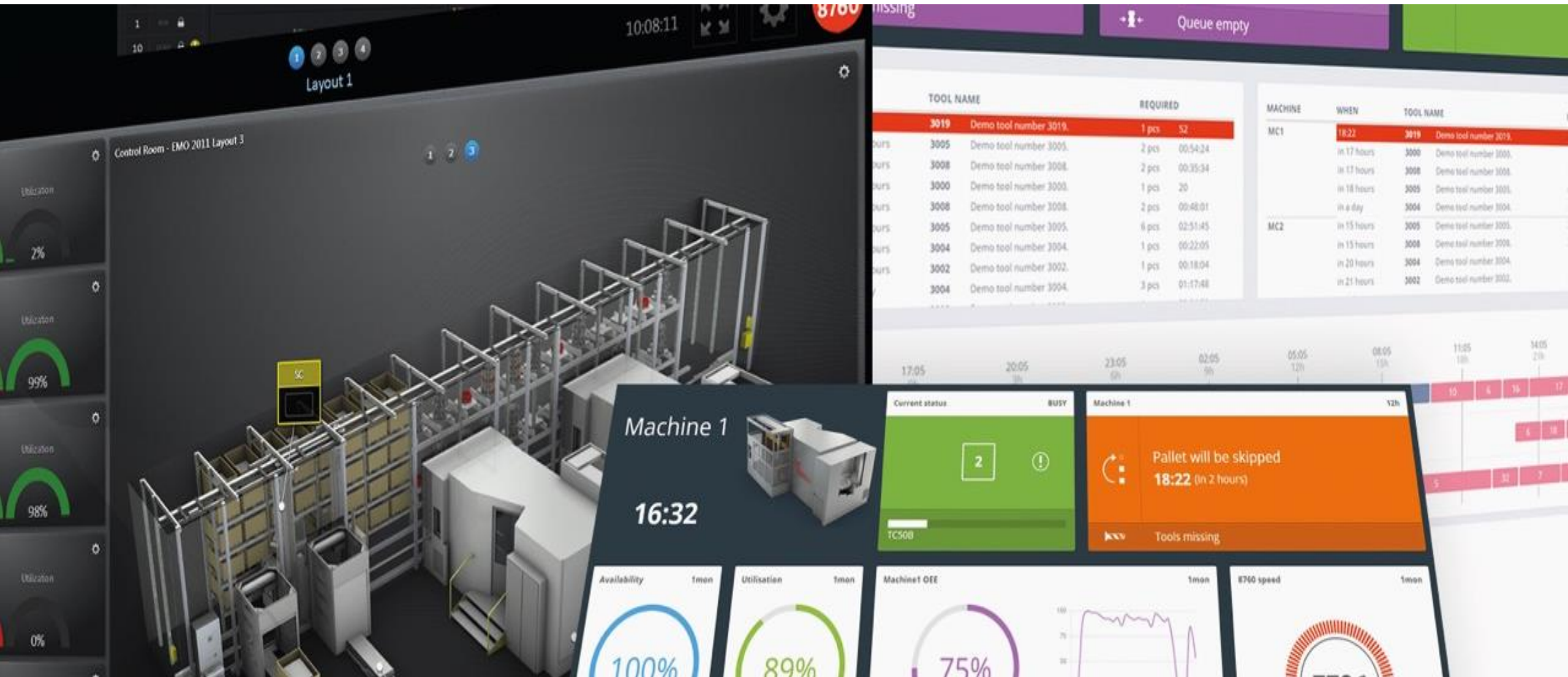
‘We are looking for collaboration that provides industry with new solutions to increase efficiency, productivity and environmental friendliness.’

Sustainable Manufacturing Finland -program, Business Finland

Today - Manufacturing intelligence



Today - Manufacturing intelligence



Today - Manufacturing intelligence

Demand for higher quality and traceability

✓ Overall view and traceability to the whole production through data-oriented manufacturing

Shortening product lifecycles and increasing level of product customization

✓ Flexibility and scalability

Demand for shorter delivery times combined with shortened planning horizon

✓ Fast reaction and adaptation to changes

Pressure to reduce capital tied up in inventory

✓ Economically feasible batch size one

Labor shortage

✓ Attractive new roles and unmanned production hours



***„Sustainability is here to stay
- or we may not be.”***

Niall FitzGerald





Source: <https://sustain.wisconsin>

The evolution of manufacturing excellence

The Ford System

The assembly-line process to produce items more quickly, and at lower costs.

Quality Management

Continuous improvement to eliminate waste, increase quality and reduce costs.

Process Re-engineering

Process mapping, KPIs, and scorecards to achieve step-changes in cost reduction.

Industry 4.0

IoT to create cyber-physical systems for analytics-based, actionable insights.

Adaptive Loops

Ecosystem-level integration of product design, manufacturing and end-user processes.

Adaptive Loops

Industry 4.0

Process Re-Engineering

Quality Management

The Ford System

- Mechanized work processes; people, machines and tools.
- Scientific management, time – motion movements.
- The assembly-line sets the pace of production.

- Quality is defined by customers' requirements, pursuing Zero Defect.
- Quality circle; Plan-Do-Check-Act
- 80% of the problems are initiated by 20% of the causes.

- Creating customer-driven pull, instead of production-based push.
- Mechanization and automation to improve process flows and eliminate bottlenecks.
- Metrics linked with root-causes and performance management.

- Interoperability for machines, devices, and people to connect and communicate with each other via internet.
- Information transparency, decentralized decisions.
- Technical assistance to support people by aggregating and visualizing information.

- Building self-tuning loops to adapt to changing business conditions.
- Ecosystemic building of interdependent capabilities.
- Applying the circular economy principles to pursue sustainability.

Tomorrow – sustainable manufacturing

System and site level

- ✓ Adaptive system level solutions (high level of structural flexibility)
- ✓ Use optimization of energy intensive resources combined with intelligent utilization of smart grid capabilities
- ✓ System level solutions for hybrid manufacturing, AM Integration
- ✓ Footprint based optimization models in mfg. operations management

Adaptive Loops

Industry 4.0

Network level

- ✓ Network level manufacturing operations management enabling true lot-size-one capabilities
- ✓ Resource sharing in network level, enabling dematerialization in manufacturing process chain
- ✓ Digital identity and memory for individual products

Human perspective

- ✓ Well-being, equality and decent work - manufacturing enabled jobs



„We are the people we have been waiting for.”

Navajo medicine man



Thank You!

www.fastems.com