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How the Swiss company MPS AG doubled its production utilization and now produces in a more sustainable and resilient way





A look at the MPS
Décolletage production
facility in Court, Switzerland



All photos: www.mpsag.com

MPS Microsystems AG

Get Two Factories For One

"As a provider of precision systems, we place the highest demands on production. The MES solution from FORCAM offers us a flexible tool with seamless real-time connection to SAP / ERP."

Raynald Richard, Manager Information Systems MPS



The company

Precision to Meet the Highest Demands

Founded in 1936 and headquartered in Biel (Switzerland), MPS Micro Precision Systems AG is a leading global manufacturer of micromechanical precision systems for industries with the highest demands, including medical technology, watchmaking, and aerospace.

The innovative medium-sized high-tech provider employs over 500 highly qualified employees at four locations, including one in the USA. MPS's business operations are divided into four divisions:

- MPS Microsystems (Industries: Medical technology, optics & photonics, automation, astronomy, aerospace & defense)
- MPS Watch (watch industry)
- MPS Décolletage (connection technology, industrial applications, medical technology, watch industry)
- MPS Precimed (orthopedic surgery and trauma surgery)

MPS also benefits from the expertise of the parent company FAULHABER Group.

Executive Summary

The benefits of MES for manufacturing

- **Realistic planning targets:** The cycle times and setup times are realistic, production-proven values for each job, and the execution is stable due to realistic planning targets.
- **Optimized capacity utilization:** By supplying the ERP planning with real-time data from the shop floor and through optimized processes, the plant utilization will improve significantly
- **Capacity doubled:** After just one year, the utilization of workstations had almost doubled to 60 percent. This means that the MPS teams have gained the capacity of a second factory without investing in one.
- **High transparency:** There is clarity about every single customer project, and all input variables for transparency are available – for example, to determine unit costs.
- **Higher process quality:** An integrated ticket system ensures that problems can be processed systematically, thus significantly increasing process quality.
- **Improved delivery reliability:** Orders start as planned and are delivered on time because all resources are available in good time.



The company philosophy

Customized Solutions, Quality, Sustainability

MPS pursues clear objectives to continue to meet the highest quality standards of many stakeholders in the 21st century. The company is determined to behave impeccably in all ethical, social, and legal matters. The CEO of MPS, Nicola Thibaudeau, writes in the company's sustainability report:

" Our mission revolves around the creation of tailored solutions that serve our customers' needs and inspire optimism across all dimensions: our people, our planet, our business, and our society."



Nicola Thibaudeau,
CEO MPS

MPS's competitiveness is to be ensured in the long term through the highest quality and cost efficiency. To this end, MPS pursues a quality assurance policy that includes rigid quality plans and strict control procedures. This guarantees that MPS can only supply products and services of the highest quality.

All production facilities are constantly kept up to date with the latest technology. Nicola Thibaudeau:

" Our strategic investments in innovative technologies are paving the way for sustainable progress, fostering economic resilience and prosperity, and minimizing environmental detriments."





Initial situation

Complex Production Landscape Requires Transparency

MPS manufactures thousands of different products and product variants for maximum precision. Before they leave the factory, the products undergo a wide variety of production steps.

MPS set out 15 years ago to optimize processes in the factory using smart technologies such as the Manufacturing Execution System MES FLEX from FORCAM.

Until then, various factors had prevented production from being optimized quickly and permanently. Above all, production data was entered into the system manually, which was time-consuming and prone to errors.



The Challenge

Transparency, Throughput Times, Resource Utilization

In 2009, MPS chose the FORCAM MES solution. The joint journey of digital transformation has already lasted 15 years. Raynald Richard, Manager Information Systems, on the primary goal at the start of the collaboration:

"The most important thing for us was a flexible planning tool for greater transparency, shorter lead times, and better use of resources.

The teams from both companies defined a roadmap with milestones and essential measures to achieve this.

Key Requirements

- **Project-related production:** Because many MPS products are unique, they should be manufactured for individual customer orders.
- **Flexibility:** This results in the need for flexibility and adaptability—production must be designed to meet a wide range of requirements.
- **Cost transparency:** Clear target times should provide a transparent view of each product's costs.

Important Measures:

- **Real-time:** Enable real-time production control based on current status data and real-time monitoring
- **Transparency:** Gain clarity about all deviations and performance losses at machines and workstations
- **Reports:** Precise machine status values for feeding into the reports via machine data acquisition (MDA)
- **Synchronization:** Synchronize corporate planning (ERP - Enterprise Resource Planning - in this case SAP) with production





The solution

From the Pilot to CIP

Pilot Phase: Start with Problem Areas

The entry into digital performance optimization started with a standardized machine connection. A team of process engineers and foremen identified the machines and systems most frequently experienced malfunctions. The pilot phase focused on these "problem areas".

Desired performance data was defined, the machines were digitally connected, initial analyses were carried out, and performance data was visualized in real-time at the operator terminals using key figures. This was the basis for the subsequent rollout and the data processing of more than 357 connected machines today.

Overall Equipment Effectiveness OEE Provides Important Insights

In the next phase, the transformation team focused on improving the utilization rate. Overall Equipment Effectiveness (OEE) was chosen as the key figure. This "Key Performance Indicator" (KPI) relates the three dimensions of availability, performance, and quality.

The most important findings from the use of the MES:

- **Utilization:** The first shop floor report with MES FLEX after the digital connection of the machines showed a capacity utilization rate between 30 and 40 percent. This percentage range was expected due to the number of orders, processes, setup phases, and product variations.
- **Cycle time:** The second finding was that cycle times varied significantly, ranging from 20 to 50 percent above the actual execution of the orders.
- **Resource availability:** The third finding was that production was delayed after a process started. This was because not all the necessary resources were available at the machines at the scheduled start time.



FORCE
MES FLEX

The MES FLEX Solution

MES FLEX is the holistic MES solution for the digitalization of the factory. The integration platform serves as the central data hub of your smart factory and helps you with the modular MES applications (Manufacturing Execution System) in the analysis, planning, control and optimization of your manufacturing processes. Thanks to its modular structure, the solution can be customized to your needs and goals.

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Precision mechanical products from MPS

Synchronization with Corporate Planning and ERP

The next step was integrating the new real-time performance data from production into the company's planning system, MPS's SAP/ERP system (ERP = Enterprise Resource Planning).

With realistic master data, the planning teams also gained a completely new level of transparency, enabling them, for example, to estimate cycle times for orders or staff schedules much more realistically.

New Structures, Processes and CIP

Alongside all these measures, new structures and workflows were discussed, organized, and practiced in production. This is crucial for the success of a digital transformation in production: all employees receive thorough training in the new technology and processes and are motivated to contribute independently to the production's success. Since then, the company's new daily routines have included, for example,

- Measuring success by analyzing key figures and reports
- Identify key topics
- Discuss ideas for improvements openly
- Calculate investments for improvements
- Implement improvements promptly

MPS has also introduced a continuous improvement process (CIP) for all involved teams to optimize planning, production, and processes in the long term.



MPS Microsystems manufacturing at the headquarters in Biel



Summary and outlook

Detailed Planning, Energy Management, Visualization

MPS Micro Precision Systems AG improves its economic resilience by targeted investments in innovative production technology. With the support of FORCAM technology, transparency, efficiency, and quality in manufacturing have been permanently optimized for 15 years, advancing sustainable manufacturing goals.

Utilization has doubled, unit costs have been reduced, and planning and delivery performance have been significantly improved. The optimized total cost of ownership has led to higher total profits, which are available for future investments.

Further optimization on the shop floor is to be advanced primarily through three levers in cooperation with FORCAM:

- Detailed Scheduling with the new product DS4EX (Detailed Scheduling for Execution)
- Energy management as part of the MES FLEX solution
- Visual reporting with widget solutions



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