



From Manual to Smart Manufacturing

How LOEW Präzisionsteile GmbH in Nuremberg (Germany) has significantly optimized order throughput with digital production



LOEW Präzisionsteile GmbH

From Manual to Smart Manufacturing



“**Digitization is a high priority for us. This means that we always have a direct overview of the order status and cost structure with simultaneous, standard-compliant documentation.**

Harald Hufnagel, Managing Director



COMPANY

Most Sophisticated High-tech Components

LOEW Präzisionsteile GmbH in Nuremberg is a certified, reliable and competent partner for all aspects of precision parts and machining.

For 30 years, the company has been manufacturing the most demanding high-tech components with innovation through creativity, technology and experience. With 50 highly qualified employees, LOEW specialises in the manufacture of complex components from a wide range of materials and their finishing.

Customers come from a wide range of industries, primarily medical sector, aerospace, defence and optics.

EXECUTIVE SUMMARY

Added Value With MES FLEX

- **Quality:** Improved delivery dates
- **Planning:** Clarity on how many operators a shift requires
- **Process efficiency:** Operators have all job data on screens (no more searching for the work card)
- **Transparency:** Which machine is running and for how long? When can the next job start? Why did the machine stop?
- **Documentation:** Valid data for standard-compliant documentation for ISO 9001, EN 9100, EN ISO 13485
- **Customised software:** Standard software adapted to individual needs
- **CIP:** Shop floor data can be used for continuous improvement processes (CIP) - including optimized calculation of orders



LOEW Präzisionsteile GmbH employs 50 people



INITIAL SITUATION

Manufacturer in a High-Wage Country

LOEW Präzisionsteile GmbH operates in the high-wage country of Germany under intense price pressure. The medium-sized company has to hold its own against global competitors on a daily basis.

To ensure its competitiveness, the digitization of production has been on the agenda for some time. After a relocation in 2022, the topic was planned and implemented.



“ We are under a lot of price pressure and have to hold our own against global competitors. What works in our favour is our proximity to our customers in Germany.

Frank Zeilinger, Quality Management Officer



CHALLENGES

Manage Costs, Increase Efficiency, Meet Standards

In order to calculate competitive prices, management must have a precise overview of the status of each order and the current cost situation at all times.

In addition, LOEW's key customers in the medical and aerospace industries require their suppliers to be certified to EN ISO 13485 and EN 9100. This demands complete documentation of all production processes.

Organisationally, the challenge was to structure the digital transformation process in a targeted manner. To achieve this, it was necessary to free up a full-time employee for the digital transformation. From a technical perspective, the main task was to connect different machines and control systems.

Product Selection



LOEW Präzisionsteile GmbH produces individual and frame orders from 1 to 10,000 pieces.

Approx. 2000 different products are manufactured annually.

Core Industries



Key core industries that LOEW serves include the medical sector, aerospace, optical, semiconductor and defence.



LOEW currently has 19 milling and turning machines producing high-precision parts primarily for the medical and aerospace industries.



CHALLENGES

Manage Order Situation Flexibly at Short Notice

LOEW produces very flexible, with the current 19 milling and turning machines sometimes being set up several times a day. Urgent orders have to be planned at short notice. Orders are processed in a 3-shift system. Approximately 2000 different products are manufactured each year.

Farewell to the Circulating Work Card for Each Order

Before digitization, each order was accompanied by a work card. This work card traveled through production and had to be available in several places at the same time. This was far too intransparent.

“On the monitors, I have all the information I need to plan and set up an order. The walking distances have been shortened, making us workers more efficient and increasing throughput.

Aleksandar Bozanovic, Machine Operator



SOLUTION

All Existing Machines Digitally Connected

All existing machines with different control systems are digitally connected. FORCAM ENISCO supplied I/O controllers for machines where the signals could not be tapped directly. The I/O controllers were installed by electricians organized by the LOEW team.

All Order Information on Two Screens per Machine

For process efficiency, the LOEW team developed its own worker terminal. This consists of a housing with integrated electronics, PC, two screens with an anti-glare glass panel including keyboard, scanner and USB ports.

New World: All Information on 2 Monitors



Today, there are two monitors on each machine, one on top of the other - an in-house design by LOEW. FORCAM ENISCO's MES FLEX software runs on the upper monitor, providing data from each work process in real time. On the lower screen, the operator sees the drawing of the part.

Old World: One Work Card per Order



In the past, a work card accompanied each order (customer drawing, production list, delivery notes from material and surface suppliers, test card, defect card, setup sheets). The work card contained the component drawing and the list of operations. Each step had to be confirmed.



Programming, producing, testing, delivering - impressions from day-to-day work



SOLUTION

MES FLEX Delivers Real-time Data

Today, each machine has two monitors mounted one above the other. The upper monitor displays the job status in real time using FORCAM ENISCO's MES FLEX solution. On the lower screen, the machine operator can find the drawing of the part.

In other words, all documents are 100% digital on each machine. Everything is documented at the push of a button: which operator set up, when the operator changed, which parts were produced.

Standard Software is Customized

The FORCAM ENISCO team adapted the standard solution MES FLEX to the specific requirements of LOEW. Some examples:

- Retrieval of component drawings: An extra button allows the operator to call up the drawing of a component at the touch of a button.
- Correct material used? Workers can see at a glance whether they have used the correct material via an automatic message.
- Production within the calculated time? A green or red signal on the monitor lets foremen and machine operators see at a glance whether a part is being produced within the specified runtime.

“We now have the great advantage of having an overview of the entire production process. We can see on the screen how busy each machine is.”

Sebastian Werner, Production Planner



OUTLOOK

Continuous Improvement Has Started

The continuous improvement process has started. Team leaders meet twice a week.

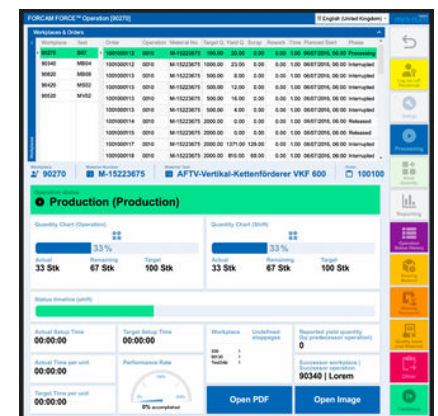
Other individual additional applications in the ERP system are planned - for example, automated alerts to the sales department if an order is delayed. This will enable the sales department to optimize its post-calculation. MES FLEX automatically provides the basic data for this.

Further digitalization at LOEW will extend to quality management.

Flexible and Efficient with MES FLEX Solution



Examples of real-time information on worker terminals from the FORCAM ENISCO training factory



Please do contact us for more information:

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"PAPERLESS PRODUCTION HAS MANY ADVANTAGES: WE KNOW THE EXACT CAPACITY UTILIZATION AND CAN CALCULATE AND DELIVER PRECISELY"

Interview with Frank Zeilinger
Quality Management Officer at LOEW Präzisionsteile GmbH



Frank Zeilinger

has taken on the role of project manager for the digital transformation as quality management officer at LOEW

That means you have to be very flexible in production ...

Exactly. Our machines are set up every day. New orders come in at short notice and are run during the late night shift. The next day, the machines are usually empty because the orders have been completed. Then we start from scratch. So we don't have a machine that only produces one part for two years, as is the case in the automotive industry.

How many products do you make each year?

We produce about 2,000 different products per year, ranging from 1 to 10,000 pieces.

In which manufacturing area is FORCAM ENISCO software used?

In the production. We have 19 production machines for machining, milling and turning of metals, non-ferrous metals and plastics. These machines are linked to FORCAM ENISCO. In enterprise resource planning, the ERP level, we use the Abas system.

COMPANY

Which industries does LOEW Präzisionsteile GmbH supply?

Frank Zeilinger: We are mainly a supplier to the medical technology, aerospace, optics and defense industries. We deliver about 97 percent of our products in Germany. We also have customers in Austria and Hungary.

Do you produce in small or large series?

Large-scale production is always an elastic term. In the automotive industry, a large series is a few million units. In medical technology, a large series can be as small as 300 units. We produce from one part to 10,000 parts per year.



LOEW Präzisionsteile GmbH in Nuremberg (Germany)

CUSTOMERS

What are your customers - and therefore LOEW - most concerned about in the current situation?

We are under a lot of price pressure and have to compete with global competitors. Made in Germany used to count for more. Today, price is everything. What benefits us is our proximity to our customers: Some have bought cheaper abroad, but then come back because the quality of the parts is not right and the assembly lines are at a standstill.

How do you measure customer satisfaction?

We conduct customer satisfaction surveys every year. Our customers give us grades - a one is the best, a six is the worst. Our goal is to be better than or equal to 2.0. We achieve that every year.

What exactly do you ask?

Traditionally, we ask about the quality of the components or the price. Packaging is also an issue, as well as communication with our employees and response times.

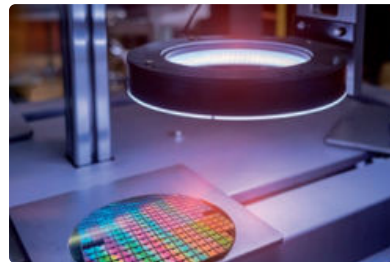
THE PROJECT

How did you start this project?

We had been thinking about going digital for some time. But it was only after a move three years ago that we got specific. I got our department heads together and asked them: What do we want to achieve? What do we need? The management also contributed their ideas and wishes. Then I went on a search, sounded out the market. Whenever things got interesting, I called a meeting of all the department heads.

Which departments were involved?

The departments that would be heavily involved in working with the new software: Production, Quality Assurance, Logistics, Order Processing. The team leaders were involved in the decision.



What hardware requirements did you have?

We got I/O controllers from FORCAM ENISCO because the signals could not be picked up from each machine. But with the I/O controller we were able to do that. We connected each machine digitally. It was a bit of a challenge, but in the end it worked.

Was it difficult because you have a heterogeneous machine park?

Yes, first of all because of the different machines and different control systems. Second, we had to learn that we still needed electricians to install the I/O controllers for us. Thirdly, we had to design two screens on each machine ourselves.





In-house Development by LOEW

What does this in-house development look like?

We built a case for two monitors and a PC. The monitors are mounted on top of each other. On the upper monitor, the operator can see the FORCAM ENISCO software interface: the worklist, which job is currently running, how many parts we have already produced.

On the lower monitor, for example, the drawing of the current part can be called up. Everything is in view. A glass panel ensures that no chips or drilling water can contaminate or damage the monitors. Fans keep the PC cool from 35 degrees.



Were there any other hardware requirements you had to address?

Yes, we had to expand our server landscape to meet the requirements of the new system. That's why we invested in new infrastructure to support the new software.

RESULTS

Have your initial expectations for digital production been met?

Yes, it's going very well. We now have a clear view of the utilization of our machines: Which machine is free and when? When can we start the next job? Especially when you have to run machines at full capacity, it is very helpful to be able to draw conclusions as to why they are not running. If you can see all the reasons for downtime, that's a big advantage.

Have the key figures improved with digitalization?

Definitely. We have definitely improved our delivery dates since we introduced the combination of FORCAM ENISCO and Abas systems. Deviations from the planned delivery date are recognized at an early stage and measures can be initiated in time.

Have you had your first successes?

Yes, there have definitely been successes. For example, we now know exactly how many operators we need in each shift to keep the machines running at 100 percent. Nobody is overworked. That's why we were able to get the team on board so quickly.

We also used to be completely paper-based, with one work card per job. This work card traveled from machine to machine through production. Because our operations often run in parallel, someone always needed the work card.

Explain the principle of the old work card ...

The drawing of the product was printed on each work card, and the work sequence was listed with spaces for you to sign. There was only one copy of each card. It was our documentation for the product. If we were working on the same part in different places at the same time, we would have to look for the work card. That is over.



How do your teams work today?

Today, the worker goes to the machine, sees the next job on his screen, and has all the necessary master data at his fingertips. All important job information is digitally available at the worker's terminals. This is a great saving for everyone: no one has to look for the work card or anything else. Walking distances have become shorter. This has been well received by everyone.

Can you measure the time saved?

I think we have certainly become faster in terms of documenting work processes. But there was no time tracking before. No one could prove how long it took to document or search for work cards. But now that we can access everything digitally at the touch of a button, it's perfect for us.

Your company is certified. What are the requirements for the software?

In the aerospace and medical industries, a lot of documentation is required. We have to be able to prove at any time which employee produced which part on which machine at what time. In addition, there are annual audits by the notified authorities.

Today, all documents are 100% digital. Everything is there: I know which worker has set up, when he went home, when the next worker starts, which parts have been produced. At the push of a button, I have all the information for each order and can track everything at any time.

SOFTWARE-PARTNER

Why FORCAM ENISCO? Why Abas?

We looked at several competitors on the market. FORCAM and ABAS had the greatest overlap with our requirements. That's why we decided on the combination FORCAM / ABAS.

What customizations did you request in addition to the standard FORCAM ENISCO components?

In Abas as well as in FORCAM ENISCO we had things adapted.

In FORCAM ENISCO, for example, we added a button with the term 'drawing'. When I click on it, the drawing for the current order is displayed. So the worker can access the drawing at the push of a button.

The FORCAM ENISCO team adapted the standard software to your needs ...

Yes, another customization that the FORCAM ENISCO team has done for us concerns material batches for the aerospace and medical industries. For these customers, it is always necessary to be able to trace which piece of raw material has been used for which order. For this purpose, we "needle" our material. This means that we apply a Data Matrix code. The material is scanned before it is processed. In the FORCAM ENISCO software the operator now sees 'This is the right material - use it' or 'This is the wrong material - do not use it'. The material batch is stored in the ERP system, which compares the specification with the material actually used.



How important is this flexibility in the system?

I wouldn't have been happy if I had to work with the standard. There were still some adjustments to be made. But the FORCAM ENISCO team implemented everything. For example, this widget: we built in a visualization to show if the component is within the calculated runtime. If it is, you can see a green frame around the job. If the component runs longer than calculated, a red frame is set. This way, we can see by passing by if a machine is on time or not and can take action. In the past, foremen and machine operators only noticed deviations during post-calculation. By then it was too late.



Do you use production data to optimize the quote?

Yes, we evaluate the reported times on a daily basis and see where we can optimize the next job. This also gives us ideas: For example, switching from single clamping to multiple clamping.

Has a continuous improvement process started?

Yes, it has. We have team leader meetings twice a week to discuss these things. I'm currently in the process of having something built on the Abas side that automatically generates a message to the sales team when something is overdue. Then we can do an exact recalculation of costs.

The data comes from FORCAM ENISCO. Everything is recorded correctly and transferred to Abas. The target/actual comparison must then be carried out in Abas.

REVIEW AND OUTLOOK

As a project manager, what have you learned from the implementation process?

The most important thing is intensive and constant communication and coordination. We had a three-party team consisting of LOEW, FORCAM ENISCO and Abas. It wasn't just a question of IT architecture; we also wanted certain things to be customized for us. Hardware issues came later additionally.

What advice would you give to companies that are about to embark on such a project?

I would emphasize three things: Appoint a central coordinator for the digital project early on; it's a full-time job. Second, make sure that you work across departments and do lots of practice rounds with this large team. Third, do as much internal testing as possible.

What should further digitalization look like at LOEW?

Quality management is not yet digitally connected. We are still using analog technology and recording measured values on test cards. This is the next step towards further digitalization.

Thank you very much!

**Please do contact us
for more information!**



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A strong team (from left): Frank Zeilinger (Project Manager), Sebastian Werner (Production Planner), Aleksandar Bozanovic (Machine Operator), Siegfried Maigler (FORCAM ENISCO), Harald Hufnagel (Managing Director), Daniel Lades (Deputy Production Manager)