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Innovation is our world

MISSION PAPERLESS FACTORY: HOW NMH CREATES THE MANUFACTURING OF THE FUTURE WITH FORCAM

Success Story

FORCAM FORCE™ EDGE

NMH® Innovation is our world

FORCAM smart factory experts

"Today, we are working about 15 percent faster in production than before in terms of planning and managing of orders."

Christian Bulander,
Managing Director NMH GmbH

NMH GMBH AT A GLANCE

Industry: Plant and Mechanical Engineering

Location: Hohentengen (Baden-Wuerttemberg), Germany

Business Areas: Mechanical Engineering, Contract Manufacturing, Plastics Technology, Digitalization

Turnover: €19 million (2020)

Employees: >100 (2022)

The company

NMH GmbH is one of the "hidden champions" for complex measuring, testing and assembly systems. The company, with headquarters in Hohentengen, Baden-Württemberg, offers complete solutions from development through manufacturing to assembly and commissioning. Founded in 1947, the company, of around 100 employees, supports customers as a reliable partner in plant and mechanical engineering, as well as special machine construction.

With the claim "Innovation is our world", NMH solutions satisfy high expectations across five continents: In Europe, Asia, North and South America, as well as in Africa leading organizations trust in the quality and innovative strength of NMH. NMH is export-oriented, meaning they are always in position to respond and ensure first-class solutions, even under difficult requirements.

The goals

Mission paperless factory: NMH pursues the goal to manage the entire production on an electronic basis; without paper. This means that work is made easier, efficiency is increased, and resources are conserved.

A major step towards this goal was the development of NMH's own "COCO" manufacturing software, the Control Cockpit. COCO sets new standards in paperless production. All processes are controlled, checked and managed centrally, and it integrates all applications in real time. Every employee and each unit always have up-to-date and complete data.

The project

What NMH was still lacking was comprehensive connectivity for machines from different manufacturers. NMH Managing Director Christian Bulander says, "We have not yet started the various manufacturer-specific interface connections until now because of the intensive software development."

The solution was cooperation with FORCAM as a specialist for machine connectivity and the integration of various IT solutions. The pilot project took place in the record time of five working days. The NMH team, together with FORCAM's smart factory experts, networked three pilot machines and integrated four software solutions into NMH's existing IT architecture.

"We have significantly increased availability of milling machinery by an average of 30 percent. In other words, we need less time to produce a part today"

Christian Bulander

"The FORCAM approach of combinable IT solutions based on an open platform enables us to further develop our production in line with requirements"

Christian Bulander,
Managing Director NMH GmbH

Summary

With its COCO software, NMH sets new standards in paperless manufacturing and environmental performance, with all manufacturing processes now centrally controlled, checked and managed. The FORCAM solutions have seamlessly integrated into NMH's system architecture, establishing machine connectivity, which then yields real-time evaluations such as machine data acquisition (MDA), overall equipment effectiveness (OEE), and networking with enterprise resource planning (ERP). The pilot delivered positive results in terms of higher efficiency and sustainability after only a few days.

"For our mission of paperless manufacturing, we can ideally complement our manufacturing software COCO with FORCAM solutions"
Christian Bulander

The project steps

1. The foundation: Connecting machines, preparing signals
The flexible platform solution FORCAM FORCE EDGE enables the smooth connection of all machines via plug-ins and the harmonization of signals into a uniform data set (Digital Machine Twin). The data is then forwarded to higher-level systems via all common interfaces (HTTP/REST, MQTT, OPC, ETC.).

2. Create transparency through standardized evaluations
In the next step, availability and error reasoning were set up for the initial series of five machines. NMH also uses the software-as-a-service solution FORCAM FORCE SAAS. The preconfigured real-time analyses for machine availability (MDA) and for overall equipment effectiveness (OEE) create transparency and support the Continual Improvement Process (CIP).

3. Opening up perspectives with further MES-Apps
In order to optimize energy consumption, NMH plans to integrate further software solutions, such as energy monitoring. This application and numerous other turnkey MES applications (Manufacturing Execution Systems) are included in the FORCAM FORCE IIOT solution.

The results

Speed: After just one week, NMH workers were working with real-time analytics on

- Utilization of the machines
- Downtimes
- Reasons for errors

Resources conserved: Previously, an average of five A4 sheets were needed per order.
With an average of 50 production orders per day, one package of paper is now saved every day.

Efficiency increased across the board:

- Faster: Production is approximately 15 percent faster than before concerning planning and management of orders
- Smoother: All processes are digitally simulated in advance in the CAD/CAM area
- Increased Machine Availability: In milling, the spindle running time has increased by 30 percent on average, and thus the number of parts produced has also increased

Looking for an IIoT solution?

We would be happy to support you with our expertise in the digitalization of your production.

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“Our mission is the paperless factory“

Interview with Christian Bulander,
Managing Director NMH GmbH

Since when has digitization played a role at NMH?

Christian Bulander: The first ideas for digitization came to us in 2015. We asked ourselves how we could optimize and simplify our Enterprise Resource Planning (ERP). In 2019, the first ideas for our own COCO production software, our Control Cockpit. The go-live with the first prototype of COCO followed in October 2019.

How did you come up with the idea of COCO – and how does the software work?

Christian Bulander: It started with the fact that we kept having problems finding parts or tools. At first, we came up with the idea of locating each part with a label and chip. We rejected that. The solution was then an electronic TAG with a QR code. Today it works like this: The employee holds the TAG with a QR code in front of the webcam of a computer which then scans and receives all the necessary information such as order data, tool tables, digital measurement logs, and NC programs for the milling machines in a matter of seconds. A TAG accompanies an order from start to finish and is then fed back into the cycle again.

M*r. Bulander, who is NMH?*

Christian Bulander: We are a „hidden champion“ for complex measuring, testing and assembly systems. As a specialist in plant, machine and special machine engineering, we offer complete solutions from development and manufacturing to assembly and commissioning. We deal with the development and construction of special machines as well as the individual and serial production of metal parts and plastic injection molding articles. Our motto is “Innovation is our world‘. We fulfill this performance promise as a high-performance team with a total of around 100 employees.

NMH GmbH Headquarters in Hohentengen, Baden-Württemberg

"For industrial SMEs, the advantages of digitization are obvious: higher efficiency and significant cost savings in production"

You now offer COCO on the market. So, you have turned an internal IT innovation into a product?

Christian Bulander: Exactly. We found the first customer for COCO in 2021. But it's not just about selling the software. The service it provides is our central focus.

What does this service look like?

Christian Bulander: We see ourselves first and foremost as a service provider, also in the digitalization business area. Many medium-sized companies have a great deal of respect for IT and new interfaces. They would rather concentrate on selling their products and optimizing their processes. That's why we at NMH start every customer project with a one-day workshop. This is the current situation at the customer's site. Afterwards we develop a proposal for a project and accompany them in the implementation phase. NMH is a manufacturer of special machines and a software provider at the same time.

NMH is a manufacturer of special machines and a software provider at the same time. How do you ensure the necessary IT competence at NMH?

Christian Bulander: We have our own development team of three, soon four people. Their focus is the project business. So, the IT colleagues make sure that everything is running smoothly for our customers. The shortage of skilled workers is a major challenge for us as well.

Microsoft CEO Satya Nadella has said: "Today, every company is a software company. Do you agree with that?

Christian Bulander: Yes. I can't really think of any industry in which digitization no longer plays a role. For the advantages are obvious: greater efficiency and significant cost savings in production through the use of software. But today even a food stand can best reach its customers via digital marketing. Whether it's the manufacturing industry or a take-away restaurant, I'd like to see more businesses offer their customers apps that allow them to easily place orders or make appointments. Waiting on hold is not keeping up with the times.

In which areas of NMH is digitization most important?

Christian Bulander: At NMH, the focus of digitization is on production. This is where FORCAM comes into play. Then come the areas of service, products and suppliers. In the case of the latter, the suppliers, a lot of convincing is often necessary regarding which options can save resources on both sides.

Going paperless: An NMH employee holds an electronic TAG in front of the webcam

"Until now, we lacked connectivity for machines from different manufacturers. Then we came across FORCAM"

What results and benefits have you achieved in production achieved?

Christian Bulander: Our mission is the paperless factory. We have taken a giant step forward in this.

- In the past, we needed an average of 5 A4 sheets per order. With an average of 50 orders in production per day, that meant one package of paper per day. With the use of TAG and QR code this is a thing of the past.
- On the subject of efficiency: Today, we are producing about 15 percent faster than before in terms of planning and management of orders.
- Production itself - especially milling in our case - also runs more smoothly. We simulate all processes digitally in advance in the CAD/CAM area. The result is that there is no longer a "hello watch" experience at the machine like it used to be. Everything is digitally planned in advance.
- We have also increased machine availability. Take milling, for example: A machine is only value-added when it is running and the spindle is turning. We have increased the spindle running time on the milling machines by an average of 30 percent and thus the number of parts produced. To put it another way: We now need less time to produce a part.

How have you achieved this?

Christian Bulander: We communicate as regularly as possible. We deliberately proceed in stages: First the standard processes, then the NIO processes, and then the special processes, but always with the 80/20 rule - 80% are new process, 20% are adopted, then we network the sites. After each step, we try to be aware and communicate, what we have achieved together, what has been has been gained.

Why do you still use FORCAM when you already have your own COCO manufacturing software?

Christian Bulander: For our mission of paperless manufacturing, we can ideally complement our manufacturing software COCO with FORCAM solutions and get an end-to-end digital solution on a wide variety of machines. Until now, we lacked machine connectivity for machines from different manufacturers. We have not yet been able to integrate the various manufacturer-specific interface connections due to the intensive software development. Then we came across FORCAM as specialists in machine connectivity and solution integration. The FORCAM approach of combinable IT solutions based on an open platform enables us to further develop our production in line with demand as well as new opportunities for both product worlds.

What is the digitalization roadmap at NMH?

Christian Bulander: It may sound strange: we have a very simple and straightforward roadmap for digitization. Our experience is that we have more successful with projects if we don't set a lot of targets in long meetings and we don't plan too much. We are faster and better with innovations if we just get going and do it. In concrete terms, this means that everyone who has an idea contributes it. Then we discuss the idea. And when we want implement it, the 80 percent rule is enough - in other words, 80 percent achievement of the target goal. Further optimizations then follow later. In this way, especially at the beginning, we were able to tangible success relatively quickly, especially at the beginning.

The basis for the production of the future: the connection of machines from a wide range of manufacturers

"My advice: just go for it, dare to do something. It is particularly important to involve employees and motivate them to come up with their own ideas"

An example?

Christian Bulander: One of our employees had the idea that we should also work with QR codes for internal orders with delivery bills in order to be even more efficient. So, in the future, our delivery note samples and other internal documents will also be QR codes. A software records the text and information of each order, which can then be accessed via QR code.

Another example: with the introduction of FORCAM machine connectivity and the direct recording of reasons for downtime, the idea came up to also provide more transparency and make this information available to workers and plant management via dashboards. Before, it was a gut feeling. Today, we can precisely track reasons for errors on the dashboards and, if necessary, derive targeted measures as needed. This further increases our productivity and efficiency.

What are the next steps you want to take?

Christian Bulander: The next step in our joint plan is to use the apps for overall equipment effectiveness - OEE - and for energy monitoring. The connection of robots is also on the agenda.

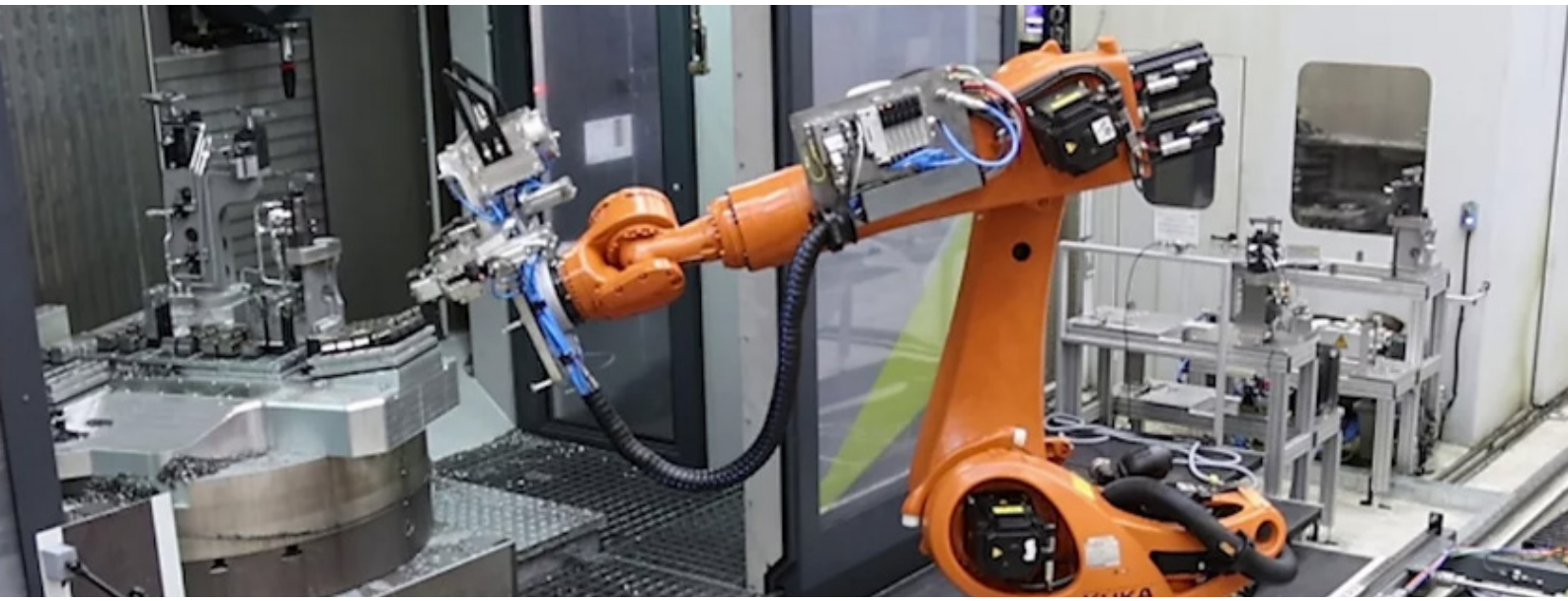
What advice do you have for midsize companies that are still hesitant about digitization?

Christian Bulander: Just get started, dare to do something. It's especially important to take your employees in along the digital journey and motivate them to come up with their own ideas. Part of our CT process is that employees can simply come to the team leader and talk about their ideas. Because some shy away from writing something down. The direct conversation is much faster and better. Another piece of advice: Don't waste too much time on planning and don't aim for 100 percent digitization right away. It sometimes makes sense to continue doing certain tasks conventionally for the time being.

Will the factory of the future still need people?

Christian Bulander: Yes, even robots and digitalization also need support. But the know-how level of these employees is rising - and the gap between skilled and unskilled workers will continue to widen.

Thank you very much for the interview!



KUKA robots in production at NMH GmbH

