

PRESS RELEASE

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Automation – the digital order of the day

METAV reloaded 2020: Overcoming the crisis with digital twins

Frankfurt am Main – 23 November 2020 – *"Falling quantities, a shortage of skilled workers, and now corona – how am I supposed to machine any components effectively?" Answers to this question will be provided at METAV reloaded 2020. Two words which are certain to be heard in many conversations and meetings in March 2021 are: automation and digitalisation. Automation experts from GE Digital, Open Mind and Siemens will be revealing their ideas and solutions for efficient and future-proof factories.*

Three experts, one common digital thread: speakers at a METAV reloaded webinar in June highlighted different ways in which production can be automated and digitalised. Dr. Bernard Cubizolles, Senior Global Marketing Manager at GE Digital LLC in San Ramon, California (USA) was amongst those recommending the use of digital tools: "They allow machine manufacturers and their customers to use data that was either not previously available or was not being used."

Internet of Things (IoT) even works with older machines

One of the questions asked by participants in the virtual conference was whether it is possible to integrate older systems and machines. "Most applications in Europe are indeed based on machines that were installed and set up a long time ago," states Cubizolles. "Most IoT technologies can integrate installations into a global information system combining new and old systems."

However, there were also concerns about the time and costs involved. "With relatively little investment, companies can deploy scalable amounts of internal resources which match the growth of the business," reassures Cubizolles. "Technologies are now available that can be used to create user-friendly solutions that local engineers can then offer."

Guidelines for defending against hacking

Unfortunately, there has been an increase in hacking attacks during the corona pandemic. Cyber security for industrial applications is of paramount importance at GE Digital, and has become even more so during the pandemic. "We provide our customers with a *secure deployment guide* to help them implement our software securely," explains Cubizolles. "The guide reduces the risk of interruptions by stipulating the latest operating systems and releases. Redundant failover configurations avoid downtimes and information gaps." He also recommends the use of a cloud infrastructure as this helps resolve all these problems.

Above all, however, the corona pandemic has slowed companies down, forcing manufacturers to adopt new working methods, which have led in turn to line and system disruptions that have ultimately reduced productivity. The introduction of new procedures and regulations, some of which are very strict, has resulted in unproductive working hours for staff. "More and more machine manufacturers are realising that accelerating their digitalisation plans in response to the pandemic will give them a competi-

tive advantage," the manager emphasises. "Digitalising their machines also gives manufacturers increased control over their machinery."

Digital twins reduce costs

However, the digital transformation requires greater data analysis precision in order to proactively manage plants and machines. Of proven benefit in reducing these costs is the introduction of digital twins of machines. At METAV reloaded 2020, GE Digital is presenting developments aimed at shortening the introduction process. These include "rapid application development tools" which users can deploy for continuous improvement and streamlining of their production processes.

Siemens AG in Nuremberg even used digital twins in the development of a new control system. "For the first time, a new generation of CNCs has been developed, tested and optimised completely virtually before being ported to real hardware," reported Josef Hammer, Promotion Manager for Machine Tool Systems, in his presentation. The resulting digital twin, in conjunction with the virtualisation of mechanical systems in machines, opens up completely new possibilities for the development, distribution and use of machine tools. The result is a family of digital twins which permits virtual mapping of the entire machine tool – from its mechanics and response through to its control.

Digital twins of machines – and the new approaches

One of the main benefits of this approach is the fact that the entire development of a machine, from its design, validation, engineering and testing through to a large proportion of its commissioning, can be carried out purely virtually. This elegant digital method allows development processes, including at the mechanical engineering and automation levels, to be conducted in parallel, expensive prototypes to be dispensed with and, not least, risks to be reduced as the result of virtual, office-based commissioning. This helps the machine manufacturers to increase their operation-

al efficiency and shorten the time to market. End-to-end digital transformation also enhances the selling process by allowing concept discussions and sales talks with customers to be conducted on the basis of the virtual machine.

Great interest in the machine tool industry

Hammer reports that the solution is meeting with a favourable response from customers. For example, Elb-Schliff Werkzeugmaschinen GmbH from Aschaffenburg has praised the "greater efficiency and flexibility of the innovation and engineering processes". Siemens has also taken precautions against cyber attacks by incorporating protective hardware and software mechanisms. "The new CNC generation is integrated into the Siemens Industrial Security system, which many see as a benchmark in the industrial environment," explains the manager.

But what are the plans now for the solution that celebrated its premiere at EMO Hannover 2019? "New intelligent motion control functions can yield significant increases in productivity," explains Hammer, with METAV reloaded 2020 in mind. "But efficiency is also linked to operation, which is why March 2021 will also be about innovations in the user interface in combination with new machine control panels."

Automation generates up to 70 per cent time savings

Depending on the complexity involved, numerous steps may be needed to create a corresponding NC programme on the basis of a CAD model. Open Mind Technologies AG from Weßling can automate this programming process, thereby reducing the amount of time required by 50 to 70 per cent, they claim. Rico Müller, Project Manager for CAD/CAM automation: "Many of our customers manufacture a wide range of parts. Here, too, we can develop automated CAD/CAM processes that are typically controlled by interactive user decisions." This allows the quality to be in-

created because proven processes and processing strategies can be called upon which considerably reduce the probability of errors.

Status upgrade: From programmer to automation developer

The new technology offers customers an opportunity to create their own automation solutions. A well-trained user can thus assume the role of an automation developer without needing any knowledge of coding or a high-level language. This gives such "key users" access to the entire range of automation, which they can then use to design their own CAD/CAM process. Open Mind also offers support to customers in such projects, or can even carry out complete projects for them. "This interaction," reports Project Manager Rico Müller, "enables our customers to contribute their own manufacturing know-how to the automation processes and thus to make much more comprehensive use of them."

Effective CAD/CAM automation can also be used to counteract the shortage of skilled workers in machining-based production. The software enables users to create processes and process chains in the form of user-friendly sequences. "CAD/CAM programmers with appropriate experience are crucial here because they are the ones who design the automation processes and make them available," Müller explained during the METAV webinar in summer 2020. "But even users with little experience can carry out these processes after a very short period of training. Small companies can profit from the automation solution just as much as medium-sized companies or corporations." Visitors to METAV reloaded 2020 will be able to find out more about the company's latest automation technologies.

Author: Nikolaus Fecht, specialist journalist from Gelsenkirchen

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Background METAV 2020 reloaded in Düsseldorf

METAV 2020 - 21st International Trade Fair for Metalworking Technologies has had to be postponed by one year due to the corona pandemic. METAV 2020 reloaded will take place from 23 to 26 March 2021. It displays the full spectrum of manufacturing technology. The focus is on machine tools, manufacturing systems, precision tools, automated material flows, computer technology, industrial electronics and accessories. Added to this are new topics such as Moulding, Medical, Additive Manufacturing and Quality. They are firmly established in so-called Areas in the METAV exhibition programme, each with its own nomenclature. The target group of METAV visitors includes all branches of industry that process metals, in particular mechanical and plant engineering, the automotive and supply industry, the aerospace sector, the electrical industry, energy and medical technology, tool and mould making as well as metalworking and trades.

Articles and pictures relating to METAV 2020 reloaded can be found in the Press section at https://www.metav.com/en/Press/Overview_Press

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