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Industrial Edge turns press shop into smart factory

Machine data from the press provide valuable insights into how to optimize the operational availability and efficiency of the press.

Improved transparency, higher availability, and targeted maintenance: these were the main drivers behind a joint project of Schuler Pressen GmbH and Siemens that helps pave the way for digitalization. Using Industrial Edge, the two companies have turned one of Siemens' press shops into a smart factory.

The initial idea arose from a situation that feels a bit like a movie: "It all started with a management meeting on digitalization strategies. And then the people involved simply said: 'Let's do this together!'" Tobias Grüner remembers. As head of digitalization and infrastructure at Siemens Large Drives Applications, he is responsible for one of the company's main production facilities for large

drives, the Siemens press shop in Nuremberg. In this shop, Siemens operates nine different types of presses from Schuler Pressen GmbH. These were the machines that were to be equipped with Industrial Edge and Schuler's digital solution.



Michael Weiher and the team led by Dr. Stefanie Apprich work on improving the reliability, productivity, and efficiency of press solutions through digital services.

Open from start to finish

It was this type of agile collaboration that made the project so special, Grüner explains: “We had a kickoff workshop where the Schuler team presented a first draft of the solution, and we knew that we were heading in the right direction.” The concepts were based on the digital portfolio that Schuler has developed to support its users, says Michael Weiher, project manager for digital solutions at Schuler Pressen GmbH: “Our cloud solutions already contain applications such as the Production Monitor and the Press Force Monitor. We deploy these apps as industrial apps on our presses to provide users with information on production status and current equipment status.”

Exploring brownfield opportunities

Grüner immediately saw the benefits of this approach. “We operate several presses that are very different from each other, in terms of both process type and life cycle, which is typical for a brownfield factory. But with the applications from Schuler and with Industrial Edge, we can integrate all these different systems into one standardized solution that aligns with the architecture we have here at our site and that can provide all the information we need to optimize our processes.” Transferring an entire production shop into the digital age also was a special experience for Weiher, “as typically you would start small, with one machine, evaluate the results, and then do the rollout to

more machines. Not this time. We were thinking with a much broader scope. This was challenging, but this way you are able to create much more value right from the start.”

Agile development instead of specifications

The project was also unique in another respect – there were no specifications as to what data should be tracked and analyzed where and how. “These were all things we decided on in an agile collaboration in which both teams clearly saw that we could create enormous opportunities, even if we did not know initially where exactly or how large they would be,” Grüner explains. “So we decided together to go ahead with the implementation without knowing what the final solution would look like, trusting in the project teams’ expertise to dig up and collect all these nuggets of information and data. We decided to pioneer a new solution – and both parties really benefitted greatly from this.”



With our digital solutions, we can detect anomalies, prevent downtimes, and increase productivity.”

Dr. Stefanie Apprich, Head of Cloud Services – Schuler Digital Suite, Schuler Pressen GmbH

Industrial Edge “in a box”

The solution that is now installed in the Nuremberg factory is simple, secure, and flexible. All components for the Industrial Edge integration are assembled by Schuler in a ready-to-use cabinet – “we call this ‘edge in a box,’” says Weiher.

The cabinet contains a SIMATIC Industrial PC with all required interfaces. This box solution is installed on-site by Siemens, and the applications are deployed to the edge device by Schuler remotely from its Göppingen headquarters. The central management system enables Schuler to continuously update, expand, and service the apps, which makes the solution very versatile – “simply smart,” says Grüner. The edge device then sends the data to the Siemens internal network for evaluation and analysis.

Industrial Edge makes presses smart

At the end of the project, all nine presses were integrated into the Industrial Edge solution, and Grüner and his team have already used the machine data to generate valuable insights. “One aspect that is very relevant for our operations is the wear of machines and tools,” he explains.

“Machine wear is something that our operators can, in fact, feel – for example, through a change in the machine sound caused by a tool becoming blunt. Now we are able to actually measure this effect.

We monitor the press force and we can see how it gradually increases with increasing wear. This change is so slight that we cannot detect it using the press force sensor alone, but we can see it when we analyze the data via Industrial Edge, so we can verify that we’re doing a good job of operating our equipment.”



Edge in a box: All the system hardware is assembled in a cabinet that is easily installed by the user and then activated remotely by Schuler. “Schuler solution for Industrial Edge”



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Michael Weiher, Project Management Digital Solutions,
Schuler Pressen GmbH

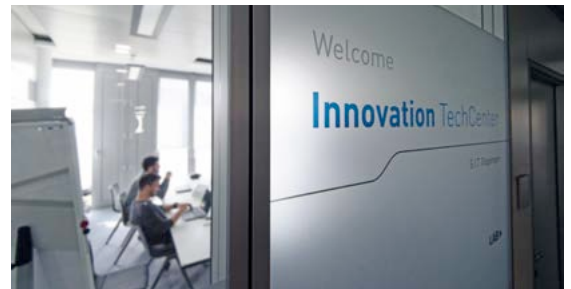
New level of collaboration and service

Siemens can also select which signals may be transferred to the Schuler cloud, where the team from Schuler uses these data to support Grüner and his team in optimizing press operation. This is another feature that distinguishes the Schuler solution: users always maintain full control over their data and can decide which data they want to share.

“We as the manufacturer know our presses best, and our users know their operations best. Combining this joint expertise with our digital solutions helps us create new services,” explains Dr. Stefanie Apprich, who heads the Cloud Services – Schuler Digital Suite segment at Schuler Pressen GmbH. Schuler will also benefit from its collaboration with Siemens in advancing these digital solutions, says Apprich: “We were able to demonstrate how we can build a smart factory with our presses, how we can detect anomalies, prevent downtimes, and increase productivity. I am certain that this industry example will help convince more users.” In the meantime, Weiher is already implementing the first add-on for the Nuremberg press shop: error analysis via Industrial Edge. “Again, we are leading the way, expanding the solution together – which to me also proves that the project does pay off,” he concludes.

Industrial Edge at Schuler Pressen GmbH

The Industrial Edge solution at Schuler Pressen GmbH relies on proven industrial components from the SIMATIC range and Siemens Industrial Edge for the system hardware and software.



The Digital Suite and Industrial Edge enable Schuler Pressen GmbH to bring digitalization directly into the press shop.

Industrial Edge apps, running on a SIMATIC IPC227E, collect the data from the press and forward the results to the Schuler Cloud and the Siemens network. The compact solution is well suited for easy integration into existing installations, and most press solutions from Schuler already come with a preinstalled package. Schuler develops applications for data acquisition and analysis as part of its Digital Suite.

With the Industrial Edge platform, the standard applications can be complemented by custom-made applications, which can then be onboarded as docker container format centrally via the Industrial Edge Hub, managed by a central Industrial Edge Management System and then be deployed with just a few clicks to decentral shopfloor systems. Comprehensive security mechanisms ensure that the data are protected from unauthorized access at all times.

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