

Easy entry to Industrial Internet of Things

For glass plant operators, manufacturers, plant and machinery builders, as well as glass processors and finishers, it is a good time either to join or expand the world of connectivity. The IIoT (Industrial Internet of Things) offers many opportunities, as Tobias Wachtmann explains.



Tobias Wachtmann.

So, what are the benefits of Industrial IoT? This is probably the most frequently asked question, as calls to merge the virtual and real worlds become louder. Companies that can offer concrete, differentiated answers generally find a receptive audience. Siemens' customers in the glass industry who have already made progress in this area unanimously confirm that the benefits were as promised and above all, what they most wanted. "Each customer has an eye on a different set of goals, which is why we have to carefully listen to them and advise them on which of the improvements that digitalisation brings actually have priority and are planned" says Tobias Wachtmann, head of Vertical Glass & Solar at Siemens.

Sights trained on individual goals

For some, it is a matter of designing processes more efficiently, or boosting productivity. Others believe that the greatest benefit of IIoT systems like MindSphere is that they increase product quality, raise service and maintenance to a new level and simplify them tremendously. And then there are those who value the IIoT because it improves collaboration across locations or even companies and

allows them to define and better track KPIs – or even to create new, digitally-based business models. Last but not least, many glass manufacturers are optimising their production to reduce resource consumption.

The benefits of the cloud ...

The cloud is the medium of choice for saving their generated data, say many customers, above all because it also adequately addresses important topics like security, data privacy and compliance. Cloud services undoubtedly offer other benefits as well.

MindSphere in particular offers a broad range of protocol options for device and enterprise applications, applications for the glass industry, comprehensive analyses and an innovative development environment that uses the open PaaS (open platform as a service) functions from Siemens and provides access to cloud services from Amazon Web Services (AWS), Microsoft Azure and Alibaba.

MindSphere also makes it possible to connect products, plants and machines located around the world to a central cloud location, which ensures high transparency in plant operations.

The successful mastery of digitalisation using an IIoT platform requires companies to establish iterative connections to various PLM (Product Lifecycle Management) tools. This improves data collection, processing, analysis and utilisation. What matters is shared, cost-effective data storage that allows companies to use less of their own resources for hardware and software maintenance, among other benefits.

... and edge computing

In some cases, however, transmitting all the generated data to and from the

cloud is impractical. Manufacturers have to be able to analyse and use the data to improve the results of production – and do it quickly. With Industrial Edge, Siemens is offering an edge computing solution that includes all the necessary hardware and software, allowing manufacturers to process production data decentrally using edge devices. In these modules, all the connected devices can be monitored, apps and software can be installed and updated and features can be transferred from the cloud to the local production system.

Edge computing is no more and no less than decentralised data processing on the edge of the network.

The best of edge and the cloud

A combination of the cloud and local, high performance data processing within glass plant operations can be exactly the right solution and will create tremendous potential for the industry. This combination enables glass manufacturers – and glass processing companies in particular – to enjoy all the benefits of the cloud, while still meeting the market's requirements for maximum flexibility and responsiveness.

Processing large amounts of data locally using edge computing reduces the user's storage and transmission costs, because only the relevant data is transferred to a cloud or IT infrastructure.

Applications for the glass industry

Many applications for the glass industry are already available across the entire glass manufacturing process – both from Siemens, from major suppliers in the glass industry or from Siemens' partners.

For example, Control Performance Analytics can be used to optimally adjust control circuits. In the process industries, some 50% of all control circuits still are not operating at the optimal settings. For example, using this application, data from the process can be automatically analysed using algorithms and provides users with instructions on how to set the control circuit parameters in order to improve process stability.

Process Event Analytics (PEA), on the other hand, provides efficient optimisation of the alarm system. The application continuously monitors and improves alarm systems in the process industries. By combining the IEC62682 and EEMUA191 standards with innovative analytics, this app can efficiently identify improvement measures. PEA requires no additional manuals or training and relies on a simple pay-per-use model.

Overall Equipment Effectiveness (OEE) makes it possible to visualise machine and plant effectiveness. This means that the OEE app can be used to display and visualise overall equipment effectiveness as a product of availability x performance x quality.

The cold end of the glass manufacturing process is where the Simatic MindSphere apps – the cloud-based solutions for industrial automation technology – come into play. For example, companies that want to track and optimise their productivity, energy consumption and machine and location service worldwide can opt for Simatic Performance Insight. This app helps identify optimisation potential by monitoring and analysing machine KPIs.

Thanks to the Notifier app, faults and other important events in a machine or plant are sent to connected mobile devices on the basis of rules. Operators or service technicians are notified ad hoc, regardless of location and can immediately respond to the event.

Simatic Machine Monitor can be used to manage machine service planning by tracking maintenance intervals.

Finally, Fleet Manager ensures the transparency of assets configured in MindSphere. It displays specific machine parameters like limit violations and also defines specific actions based



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Customers can create their own glass applications ...

Numerous companies have already developed powerful applications using MindSphere, the secure, cloud-based, open IoT operating system with an open API and scaleable development environment. This allows them to offer their own customers new digital services. Examples include ZIPPE's B-ZMART Runtime for an overview and optimisation of batch house performance and Advanced Energy's Thyro App for preventive maintenance of electric heating elements.

... more easily than ever

For some time now, this has been easier than ever. Since Siemens acquired Mendix, a low-code platform provider, in 2018, third parties no longer have to write software applications line by line. Instead, they

can simply link together the desired functions from a library using drag and drop. This speeds up software development enormously, because users can create an app with no programming experience. An example is the FMCS (Facility Monitoring and Control System) app, which was easy to generate thanks to Mendix. This app integrates information from auxiliary installations like the Simatic PCS 7 process control system.

Concrete and measurable benefits

"No matter what approach you take, only companies that can demonstrate very specific and measurable benefits to existing and potential customers will be among the long-term trendsetters in a transformed glass industry" Tobias Wachtmann concludes. ●

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