

The image features a Siemens logo and tagline in the top left corner. The background is an aerial view of a glass factory with a tall, glowing blue digital column and various digital overlays of binary code and wireframe structures. A large blue text box is positioned in the lower right, containing the main title and a sub-headline. At the bottom right, there is a white box with the website URL.

SIEMENS

Ingenuity for life

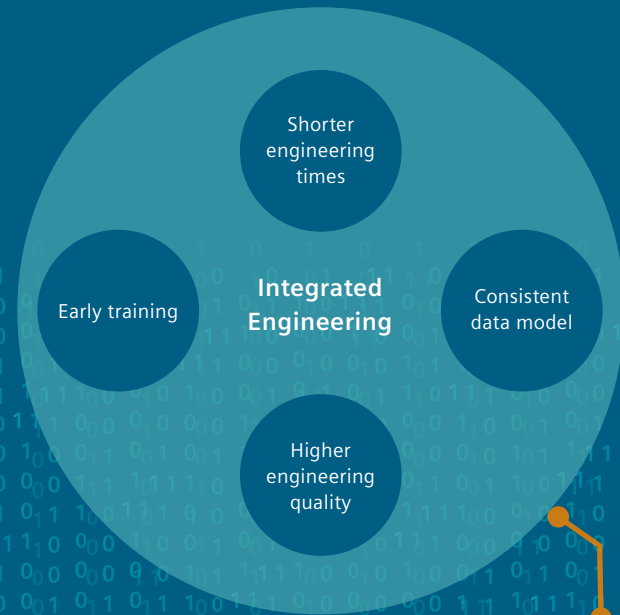
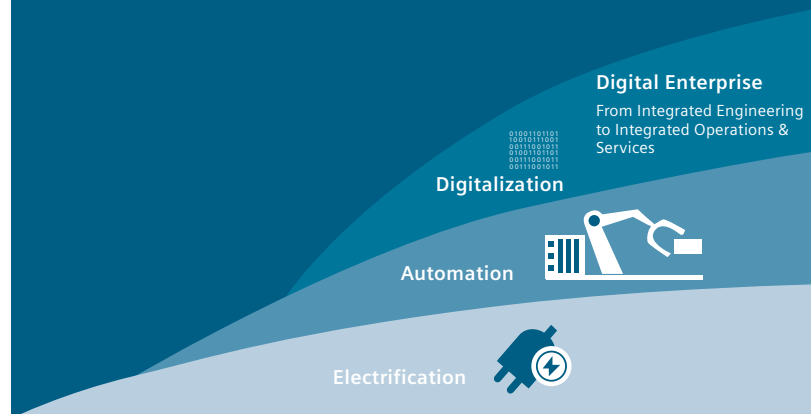
Opportunities offered by digitalization in the glass industry

Effectively generate and collect
engineering and production data
for your business success

[siemens.com/glass](https://www.siemens.com/glass)

Getting ready for the digital future of the glass industry

Data-based applications are opening up new ways to increase productivity.



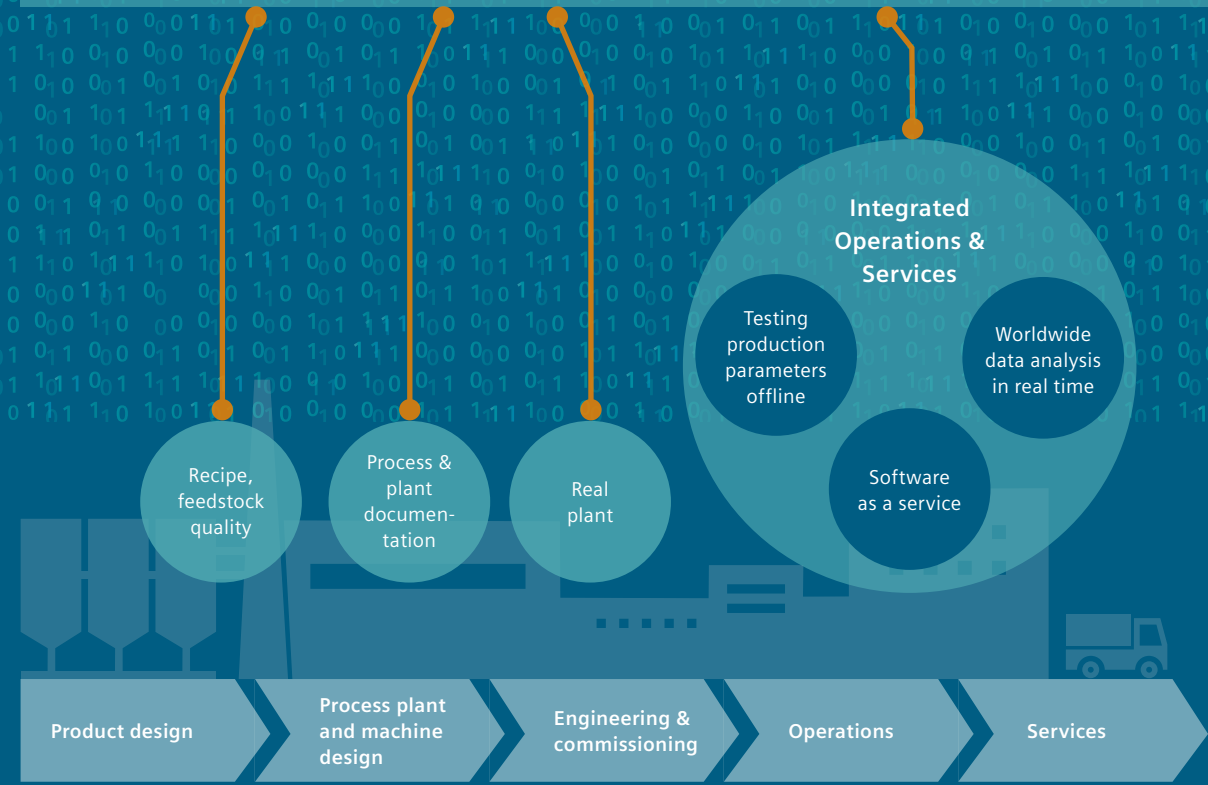
“We also refer to the digitalized value chain as ‘From Integrated Engineering to Integrated Operations and Services,’ to describe consistency throughout the process – from designing the production facility and engineering to commissioning and operation, and the associated services.”

Bernhard Saftig, head of Glass Business at Siemens



Significant leaps in productivity possible
 Digitalization solutions along the entire value chain make glass plant operators and equipment suppliers more efficient, more flexible, better and faster. Digitalization will change the face of the glass industry as much as electrification and automation did in earlier times. Significant leaps in productivity will be possible as a result.

Digital Twin & Simulation



Increased revenue forecast
 A Europe-wide study by German industry association VDMA and McKinsey forecasts that more than ten percent of revenue in the mechanical engineering industry alone will be generated using data-based business models by 2020. Open standards, powerful communications networks and integrated automation and drive technologies are also of great importance to the glass industry on its path to the digital age.

Linking the real and virtual worlds
 What does it actually mean when plant operators and equipment suppliers in the glass industry digitalize their businesses? The chart at left shows two directions, horizontal and vertical. The horizontal axis symbolizes the lifecycle of a plant. This highlights consistency, from planning the production facility to engineering and commissioning to operating the plant and the necessary services. The Plant Simulation tool can thus simulate the entire production process ahead of time. The vertical axis illustrates the link between the real and the virtual worlds in the operating phase, in other words the connection between the field, automation and management levels, right through to the cloud.

Data-based business models are also becoming increasingly relevant to the glass industry.

All photos: Siemens AG

From Integrated Engineering to Integrated Operations and Services

Benefits offered by digital solutions along the entire value chain and throughout the entire lifecycle.

Integrated Engineering

Shorter engineering times and cost savings

Plant operators and equipment suppliers that use a standardized data platform like COMOS to integrate their engineering stages reach the operating phase, and thus the market, much faster. The fact that multiple planning stages can run largely in parallel saves both time and costs. The MCD (Mechatronics Concept Designer) software is similarly used to design machine concepts. All in all, simulation tools from Siemens can help shorten the commissioning time on the real-life machine by up to 85 percent.

Digital twin: a virtual copy

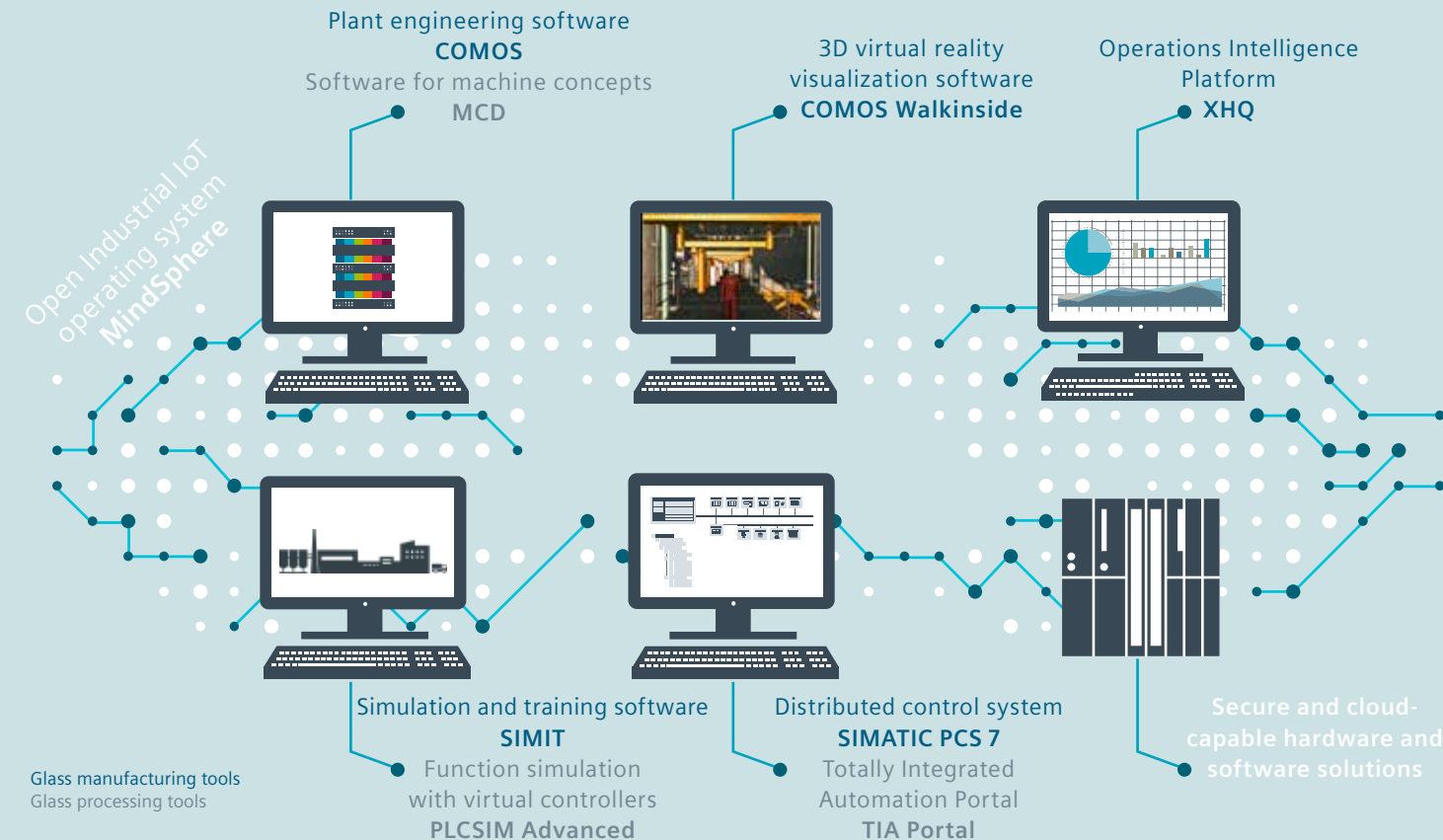
The result of Integrated Engineering is what's known as the "digital twin" – a virtual copy of an entire plant or sections of it. At its heart is a consistent data model that operators and equipment suppliers can use to run plant simulations for training purposes, for example.

Time saving and higher engineering quality

With the click of a mouse, all the data relevant to automation can be transferred directly from COMOS to the SIMATIC PCS 7 process control system. This saves valuable time that is normally spent configuring the automation structures.

Virtual inspection and early training

Even before the plant goes into real operation, operators and equipment suppliers can view it using 3D visualizations such as COMOS Walkinside and even walk through it at a virtual level. This provides an opportunity to give employees early training, and to test whether all the vital parts of the plant are readily accessible.



Integrated Services

Benefits at many levels

Digital solutions open up various possibilities for valuable services. For example, equipment suppliers can use "Software as a Service" to obtain a time-limited license for specific software rather than purchasing it. They can then access a complete engineering environment via the cloud, without having to own it and keep it up to date. Plant equipment suppliers benefit from having pre-tested packages and can perform simulations, which again save time and money during the real commissioning process. Software-based employee training can also be provided ahead of commissioning.

Commissioning: earlier and smoother

The SIMIT simulation software can acquire automation data directly from the COMOS engineering tool. This enables all automation and process control functions to be tested, so potential faults can be rectified prior to real-world commissioning. SIMIT can also be used to train operators at an early point. In conjunction with PLCSIM Advanced, SIMIT and MCD, an entire machine can also be started up virtually.

"The Gallo Glass plant is so complex that we found SIMIT essential for conducting tests and evaluations. It optimized our engineering and substantially shortened the commissioning time."

Roger Knüttel, Manager of the Control Engineering Department at EME Maschinenfabrik Clasen GmbH

Integrated Operations

Digital twin kept up to date

Data collected while the plant is in operation can be fed back into the data model. As a result, the digital twin is updated continuously and thus reflects the actual status one-to-one throughout the entire value creation process and during the plant's entire lifecycle.

Optimized servicing and maintenance

During the operating phase, operators can use SIMATIC PCS 7 to convey their requirements directly to the service

personnel. If the service personnel use the COMOS MRO maintenance software in conjunction with 3D visualization using COMOS Walkinside, these requirements can be directly located and correctly assessed, and resolved, using the up-to-date plant and process documentation. Mobile implementation using a Tablet is also an option. As a result, machines and devices can be kept perfectly maintained before any outages occur.

Improve your operating cost structure

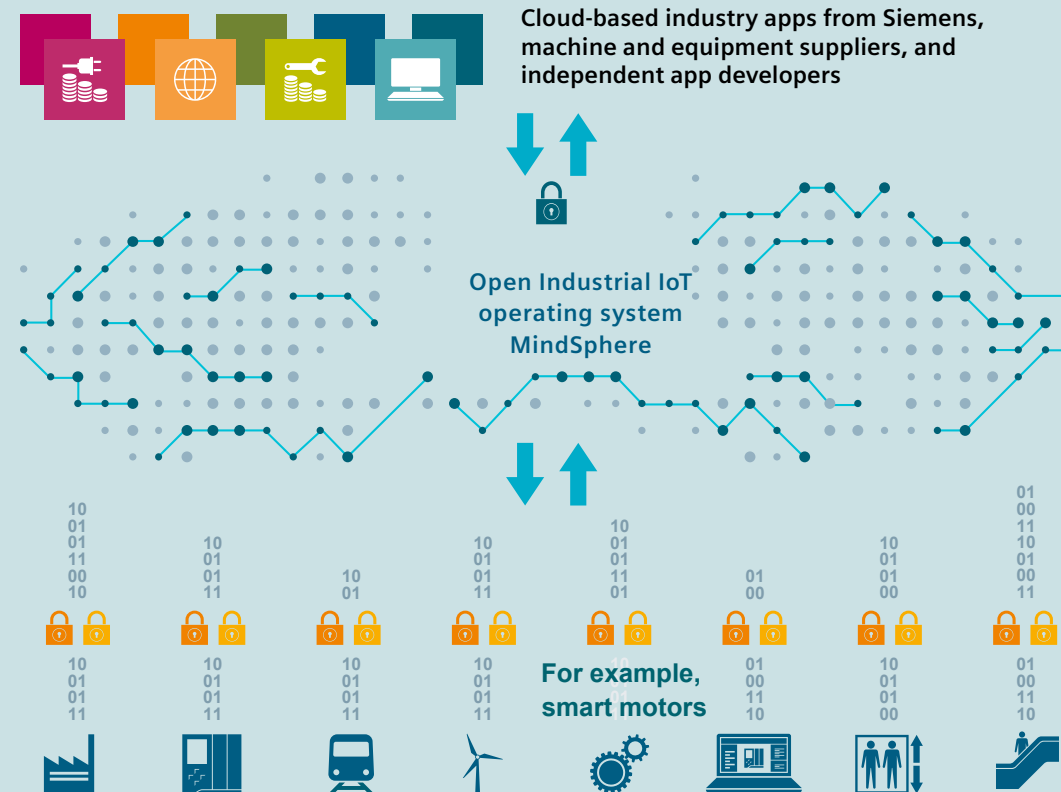
XHQ is another handy application in the operating phase, providing relevant, multi-system data and KPIs in real time, adapted to suit individual customer needs. This may be an overview of particularly cost-intensive assets, for example. Or even global comparisons between different plants at a number of locations.

Cloud-based industry apps as the centerpiece of new, data-based value creation

Connecting machines and physical infrastructure with the digital world.

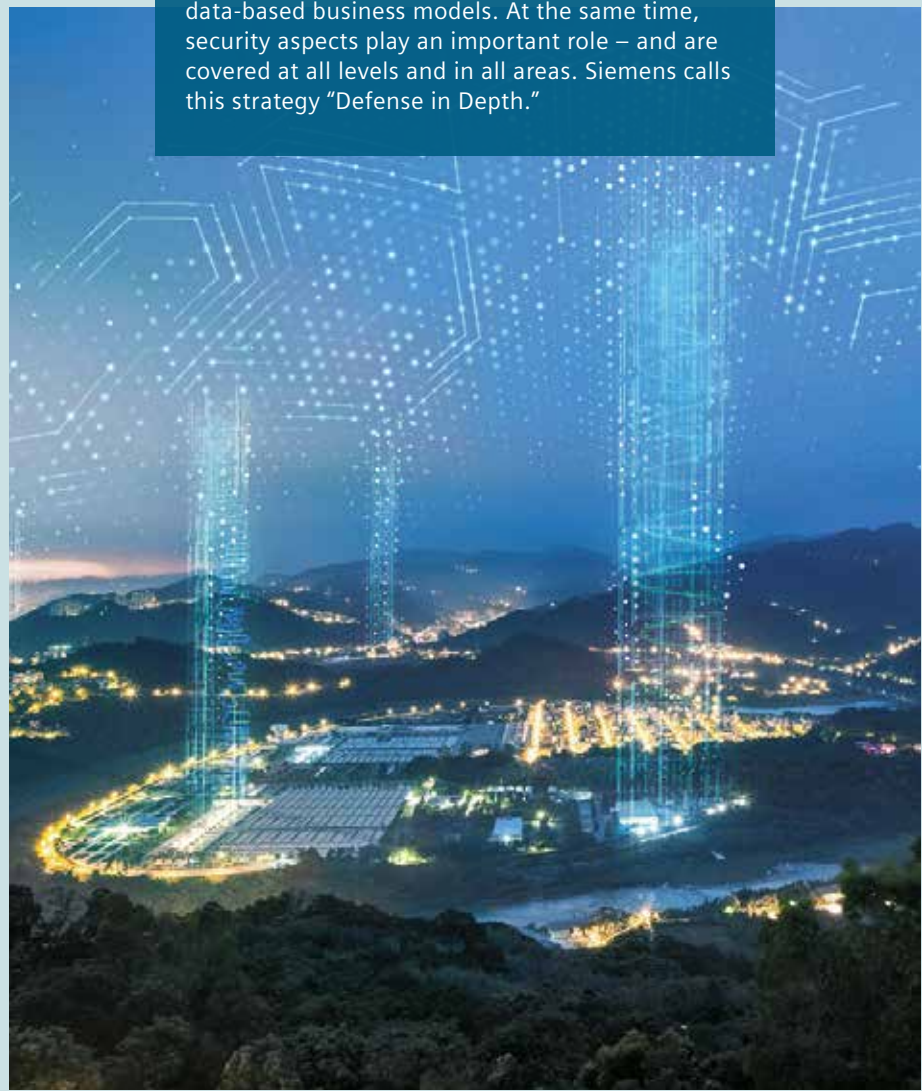
More productivity and efficiency

All activities containing the keyword "digitalization" have to involve the use of a database. What's new is that today, the data has to be available everywhere, at all times, for quite different users, if all the various businesses involved are to benefit. Cloud solutions meet all these requirements. MindSphere is one example of a Cloud-based, open Industrial Internet of Things (IIoT) operating system. Being scalable, it supports the digital transformation of companies regardless of size or sector, and provides the foundation for new, data-based business models. At the same time, security aspects play an important role – and are covered at all levels and in all areas. Siemens calls this strategy "Defense in Depth."



Integrate your own business ideas

Using the cloud platform ("Platform as a Service – PaaS") can improve aspects such as plant performance by recording and analyzing large volumes of production data. This makes MindSphere the basis for applications and data-based services from both Siemens and third-party providers, in the areas of predictive maintenance, energy data management, or resource optimization, for example. At the same time, platform users benefit from a development environment in which they can integrate their own applications, services, and thus also ideally business models.



"I look at Siemens as a supplier, a source of ideas and solutions, and as a trendsetter."

Dr. Bernd-Holder Zippe,
Chairman of the VDMA Glass
Technology Forum

Smart Motors Cloud application

Optimize efficiency, availability, maintenance and servicing
The Smart Motors concept describes a completely new generation of communications-capable drive technologies. The data recorded using integrated sensors (e.g. temperature or vibration data) can be read out quickly and easily and analyzed in Cloud environments. This means that users can improve both efficiency and plant availability, as well as optimizing their servicing and maintenance activities.



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