Press release

Hamelin/Hanover, Germany, 12. April 2021

From simulation to virtual commissioning

More and more concrete applications increase the benefit of the digital twin

The vision of Industry 4.0 is closely linked to the digital twin. However, since the degree of standardization of the individual development tools is currently still low, there are still considerable gaps in the consistency. In the field of simulation, some of them can now be closed. As a result, digital engineering already offers significant efficiency gains today.

The digital transformation of the economy does not stop at the development departments of mechanical engineering. CAD (Computer-aided design), CAE (Computer-aided engineering) and CAM (Computer-aided manufacturing) are increasingly being enhanced by smart tools that automate processes, reduce the use of time and resources, and continuously control and improve the quality of development steps. More efficient processes and an improved time-to-market are essential factors in order to be able to hold one's own in the increasingly fierce global competition.
With the Digital Twin or Asset Administration Shell (AAS), the industry has designed a concept that decisively drives this development. The goal is an uninterrupted flow of information over the entire life cycle of machines and plants: from data models used in the early development phase, to machine data from the production phase, to asset management, maintenance and repair.

Paths to digital simulation

In reality, however, there are still gaps, because there is a low degree of standardization of development tools. On the developer side, there is a continuing uncertainty as to whether the supplier of components and devices supports the respective development tools with suitable data formats.

Very early on, Lenze accompanied and promoted digitization in mechanical engineering and the concept of the management shell. Now the company is going one step further and extending its support for partners to simulation and virtual commissioning. OEMs will benefit from expanded digital engineering capabilities in the design, development, and production of machines and plants, because this is where Lenze has closed some critical gaps.

The decisive cornerstone is already laid by a 3D simulation model, which provides a relatively general model of a machine. This results in simpler diagnostics of complex machines. If one goes a step further and refines the 3D model, concrete statements about the behavior of the machine can already be predicted, such as the throughput to be achieved during operation. If the model is adapted to the specific machine in even greater detail, it can be used to simulate not only the mechanical behavior, but also the entire manufacturing process on the machine, i.e., including the logic of the machine, error management, change of operating modes and parameterization. At this stage of development, even virtual commissioning of the machine is possible.

Defuse pain points of OEMs

Lenze itself uses some of the best-known simulation tools, in particular the following applications:

SimulationX from ESI ITI: simulation and drive dimensioning;

ISG-virtuos from ISG: Virtual commissioning;

Virtual Teachware by Forward TTC: Augmented & Virtual Reality for HMI and machine diagnostics as well as learning software for virtual training.

In each case, the ultimate goal is to solve the critical issues at this stage of the life cycle: Experience shows that the requirements of machine builders include topics such as better diagnostics, shorter development times or more precise planning when dimensioning drives.

Machine builders can use these applications for themselves, relying on solutions from Lenze. The manufacturer advises on the selection of suitable tools and can provide support in modeling simulations and virtual commissioning so that these can be run directly at the customer's site. The first

projects have already been implemented, and Lenze has also prepared a corresponding show case that demonstrates the procedure and the extended possibilities of digital engineering through simulation and virtual commissioning.

Development continues

While different data models are still required for the various applications today, standardized formats and interfaces are to be used in the future. Corresponding concepts have already been developed under the name FMU (Functional Mock-up Units) or FMI (Functional Mock-up Interfaces). Lenze supports the common tools available on the market and is also continuously developing its toolchain for digital engineering.

Conclusion

Whether better diagnostics, shorter development times or more precise planning when dimensioning drives: simulation in digital engineering and parallel engineering allow machine concepts to be implemented efficiently and quickly and, above all, avoid cost-intensive rework. This is made possible by interdisciplinary development, in which control and IoT software in particular can be tested and validated on a virtual machine in the early concept and development phases.

About Lenze
Lenze is a leading automation company for the machine-building industry and a specialist in Motion Centric Automation. As a systems supplier with solutions competence, Lenze works for and with its customers to create high-quality mechatronic products and packages, powerful systems consisting of hardware and software for machine automation, as well as digitalisation services in areas such as big data management, cloud or mobile solutions, and software for the Internet of Things (IoT).

Lenze employs more than 3,700 employees worldwide and is represented in more than 60 countries. Lenze's growth strategy will see the company continuing to invest strongly in the areas relating to Industry 4.0 in the coming years – with the aim of increasing sales revenue and profitability.

www.Lenze.com

Press contact Lenze Group:
Corporate Communications:

Ines Oppermann
Phone: +49 5154 82-1512
E-mail: Ines.Oppermann@lenze.com

Always up to date: www.Lenze.com > About Lenze > Company > Newsroom

Follow us on:

@lenzegroup @Lenze_Gruppe @Lenze Group