

d1g1tal

AGENDA

09–10 | 2023/3 | NO. 27



COVER STORY Schneller zu mehr Nachhaltigkeit mit Engineering Base von AUCOTEC

MOBILITÄTSINDUSTRIE Systems Engineering macht Ingenieure zu Entscheidern im Systemkontext

MASCHINEN- UND ANLAGENBAU Eroberung neuer Märkte durch Business Reengineering

“Sustainability is the main driver of the process industry”

Dr Wilhelm Otten, former chairman of the user association Namur and long-time manager with EVONIK, on how digitalization and modularity are enabling innovation.



Dr Otten, one of your current projects is a ‘Carbon Capture and Utilization’ pilot plant in Singapore. A highly topical sustainability issue. But only an isolated case?

No, not at all! Sustainability, the reduction of the CO₂ footprint, is currently the main driver in the process industry. This includes converting the entire supply and value creation of its plants to renewable products or raw materials. For example based on hydrogen or ammonia, always in connection with renewable energy. So there is an enormous need for innovation.

Where exactly is this need and where do you begin?

Existing systems have to be converted. Either to enable their operation with renewable energy sources such as green hydrogen or to switch to more sustainable processes and products, sometimes both. In addition, there are a number of recycling projects using renewable energies. The pressure to innovate is high and also means that the engineering processes and systems required for the conversion must be highly efficient.

Our approach goes in two main directions: One is digitalization, and a really consistent digitalization at that. File formats such as PDFs are not digitalization! We need data models of the plants – real, cross-discipline consistent and complete digital twins. And they are only ‘twins’ if they correspond to the system one-to-one, i.e. reflect current as-built conditions. The second relates to modularization. Both in the products and in the engineering. There is still a lot to do here.

What do you think is a complete digital twin?

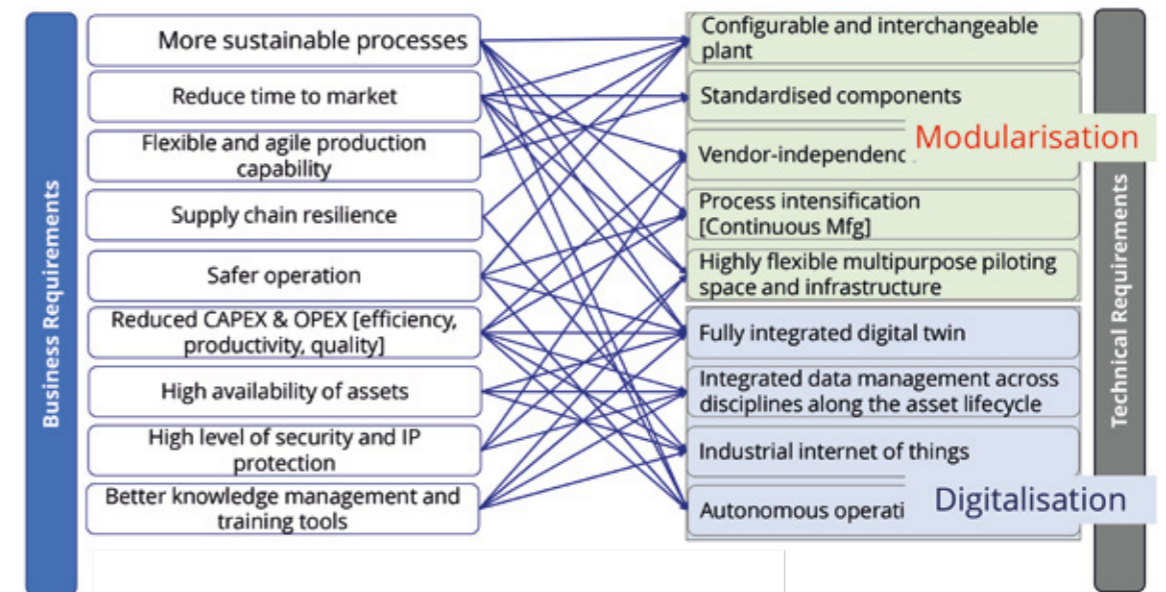
By this we mean the digital image of the entire process engineering plant, including operating resources, over its entire lifecycle. There is general agreement in the industry that this includes the process, structure, and asset models for covering processes and hardware. On the other hand, we need behavior models, i.e. simulations, for design and optimization as well as the so-called ‘operation model’ – in the case of the pilot plant mentioned, this model is the Model Type Package (MTP). It describes the services of fully modeled, tested subsystems such as feeders, mixers and so on, hence modules that can be flexibly combined and orchestrated into larger units.

You use the Engineering Base (EB) in the project planning for the pilot plant. Why?

Because the system not only captures the core of a digital twin, with all the master data, structure, and asset information. Since you need this data for simulations as well as in operation, we wanted to go further and use an integrated system that not only combines all disciplines from flow diagrams to piping and detail engineering to automation. It should also communicate with the simulation, 3D CAD, and other tools using an open standard. And it must conform to international standards such as ISO 15 926 and DEXPI. It was also very important to us that the system enables modular data management in the data model, because we are building a modular system.

General requirements for future manufacturing plants, not only for those in process industry

Source: WOtten Consulting 2023



CAPITAL PROJECTS

That's how we came to EB. It can be integrated into the entire life cycle of the system, the interface effort is significantly reduced, and, what's even more important, we have a consistent database instead of distributed tools for drawings, tables, etc. This is the only way that the modules with all their aspects can be represented as a unit, and change management is made significantly easier.

What are the concrete benefits in numbers?

We have clearly gained in quality in engineering and construction. In a pilot, we also found that the integrated engineering saves 15 percent on investments. With a current data model, i.e. digital twin, savings of another 15 percent are also possible in the operating phase in brownfield projects and in maintenance, which can result in total savings in the three-digit million region per year for large plant operators. 70 percent of this is due to maintenance and changes in the running systems.

Do you rely on sustainable engineering for the sustainability of the process industry?

That's how you can see it. We bring digitalization and modularization together. In a common digital twin with a common language for engineering. When it comes to modularization, however, we are still at the beginning. I see a development there, as demonstrated by the automotive industry: From individual products and production systems to modular cars and systems that can manufacture any type of car. Modularity will drive the process industry in the next ten to twenty years. And the engineering must be open for this.

Thank you for the interview!¹

wotten-consulting.de

¹) The interview was published in German in AUCOTEC Infopaper 1/2023.



9. Engineering Summit

DER NETWORKING-KONGRESS FÜR DEN ANLAGENBAU GEHT IN DIE NEUNTE RUNDE

Die Herausforderungen im Anlagenbau bleiben groß – vom Fachkräftemangel über die Energiekrise bis zur Dekarbonisierung. Umso wichtiger ist der Austausch in der Community, um diese und neue Herausforderungen gemeinsam bewältigen zu können.

Auch 2023 werden wir am **19. und 20. September 2023** auf dem inzwischen **9. Engineering Summit** wieder die Top-Themen im Anlagenbau beleuchten und diskutieren.

Seien Sie dabei und sichern Sie sich bereits jetzt Ihr Ticket für den Engineering Summit in Darmstadt!

Die Themen:

- Hochlauf der Wasserstoffwirtschaft
- Dekarbonisierung
- Finden und Binden von Fachkräften
- Lieferketten

3 Gründe für Ihre Teilnahme am Engineering Summit

- Die zentrale **Networking-Veranstaltung** des europäischen Anlagenbaus
- **Treffen Sie die Top-Führungskräfte** im Anlagenbau
- **Signifikanter Informationsvorsprung** dank hochkarätiger Sprecher

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