

Smart factories: constant evolution

How the development of Smart Factory demonstrates the feasibility of digitalisation



About Future Work Lab

Industry 4.0 has been the buzzword in industry for some time now. For Bosch Rexroth, that has meant the development of the Smart Factory – an undertaking which now represents more than a decade of research, implementation and, most importantly, evolution.

Led by Professor Detlef Zühlke, the pilot plant connects horizontal and vertical modules and systems from 16 manufacturers based on jointly-developed standards. That creates opportunities for collaboration and knowledge sharing, ensuring new developments incorporate the latest technologies for maximum impact. In doing so, the German-based facility demonstrates the feasibility of Industry 4.0 for manufacturers.

Solutions Sought

One of the major hurdles in developing universal solutions for digitalisation in manufacturing is the lack of universal standards, in addition to the threat of cybercrime and challenges around data security. In overcoming these obstacles, the Smart Factory pilot plant has – since its launch in 2005 – tried and tested dozens of ideas and hundreds of components.

For manufacturers, the pressure to gain competitive advantage through the implementation of Industry 4.0 solutions is building, that's where the Smart Factory programme comes in. It's these first steps and initial investments in digitalisation which support the ongoing development of smart solutions.

Highlights

Now Next Beyond

- ▶ Encouraging collaboration between researchers and manufacturers
- ▶ Proving the feasibility of adopting new technologies
- ▶ Developing universal standards to digitalisation
- ▶ Testing new solutions in real-world scenarios for greater reliability
- ▶ Equipping manufacturers with future-proof solutions

“As the demand for individualisation increases, so does the pressure for manufacturers to adapt. The Smart Factory makes that possible, delivering flexibility through digitalisation.,,

Professor Detlef Zühlke,
Smart Factory

Facilitating an evolutionary step in manufacturing

About

As a leading global supplier of technology and services, Bosch Rexroth is a driving force in factory automation. Developing solutions which combine global application experience with cutting edge technological developments, Rexroth works with organisations around the world, supporting them to implement a tailored approach to Industry 4.0.

The Solution

At the heart of the Smart Factory is Industry 4.0 – essentially digitalisation and collaboration, both between parts and people. Working with 16 different manufacturers makes it possible to understand where problems with implementation may occur, and enables solutions to be developed as they are implemented.

It's that approach which has enabled the Smart Factory to develop to its current state, taking on board a variety of solutions along the way. Along with smart devices, cyberphysical systems – in other words component assemblies that are capable of communication via a data infrastructure – have been implemented over the years.

Of course, implementing new technologies in this way meant that new learning could be made. Significantly, entire engineering capabilities needed to change in order to harness the full knowledge and expertise of partner firms.

The Results

This approach has paid dividends, and the results are clear to see. When challenges have occurred, solutions have been developed, enabling the incremental steps to digitalisation which enable manufacturers to see the most tangible return on their investment.

Noticing that the standard ethernet is not actually suitable for industrial applications, the insights and initiative of the Open DeviceNet Vendor Association were welcomed. Optimising machine integration in this way offers an open machine data model that results in a big leap forward on the path to an industrial ethernet standard. These developments can then be integrated into Rexroth components for manufacturers to utilise in their facilities as they move towards a digital future.

That future won't be fleeting. While manufacturing is evolving into the digital age, one thing that won't change is how equipment is utilised. In essence, once these solutions are in place, they won't be upgraded after just a few years. They will have to prove their functionality well into the future. That's where the value of the Smart Factory lies, providing a platform to work together, try new things and test the feasibility of digital solutions.

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