

Produce more flexibly with the Industry Cockpit

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Manufacture with the Industry Cockpit: processes and systems are connected across the enterprise in a flexible process network – so they can be monitored in their entirety and adapted at any time. Credit: Fraunhofer IPK

Customers expect products to be tailored to their needs. And not only

that: they want to influence the way the product is manufactured as well. As a result, very flexible manufacturing and administrative processes are necessary. This is an enormous challenge for companies – because most processes are quite rigid. Now, with the help of the Industry Cockpit, production has become more variable. Fraunhofer researchers will be presenting it at the Hannover Trade Fair from April 13th to 17th (Hall 17, Booth F14).

A new type of information and decision center supports manufacturers. It links processes and systems across the enterprise in a flexible process network – this way they can be monitored in their entirety and adjusted at any time. Just as with the emergency tables of rescue workers and police officers, all important data flow together. Emergency service workers need the best possible overview when they are in a disaster area, rescuing injured people and clearing away debris. In their situation centers, operation managers can see where the helpers are located, have an idea of the situation there via the helpers' helmet cameras, and coordinate the deployment.

Individual production requires flexible processes

Researchers from the Fraunhofer Institute for Production Systems and Design Technology IPK in Berlin have now developed a similar Cockpit together with the software company Pickert & Partner GmbH from Karlsruhe. The novel information and decision-making center is intended to help production managers, machine operators and planners in industrial enterprises to understand the complex processes in administration and production and to adapt to individual orders. This is urgently needed, because the wishes of customers are increasingly becoming the main focus. Customization is not limited to end [products](#); it is also becoming increasingly involved in the production processes. If one customer wants to have the temperature profiles of an additional cooling process delivered with the finished product, for example, the

next one requires a unique key performance indicator.

The entire production in view

But how can the company function as a whole, if the customer is engaged in [manufacturing processes](#) – and products still have to fly as fast as possible off the conveyor belt? This is where the Cockpit will come in handy in the future. "It combines products, machines, information systems and people all together," says Nicole Oertwig, researcher at IPK. "This lets a person quickly check, if and how a customer's requirements can be implemented – and guides the production accordingly." In the everyday life of the production manager, this means that he can let the production process for a specific product run on the Cockpit without any gaps – including individual customer requirements – while in the future also triggering the necessary changes with just a few clicks in the cockpit. He does not need any programming experience in this process: the tool can even be controlled by gestures. The cockpit also provides all the other employees with the information they need, at the right place. For example, the operator sees the process data and can monitor it.

Although industry cockpits are already available, they are not yet suitable for flexible, customized production. This is because they require a lot of effort to program only a few sequence variations, so they are very rigid. In addition, they focus exclusively on individual machines. "Our tool is dynamic. It is product focused. For the first time, we can flexibly consider products, processes, roles, or even machine systems," says Oertwig. The researchers are presenting a prototype at the Hannover Trade Fair. By the end of 2016, the scientists hope that the [cockpit](#) will be available for use in industry.

Adaptive processing robots

If production is to become more flexible, more adaptable machines are also necessary. "That's why we're developing processing robots: Because unlike large machine tools, which are expensive and not very flexible, robots can be set to individual customer requirements," reveals Sascha Reinkober, Head of Production Systems at the IPK. "We're presenting such a robot cell in Hanover: It contains all the components that an industrial robot needs in order to be used as a processing machine." For this to work, special control and regulation procedures are necessary which can compensate for any mechanical deviations. For this purpose, the researchers have created a separate development platform. Using this interface, the researchers can install additional control and regulation software in the robot. They can plan new processes and program them first on an external control PC and then test them on the real industrial robot.

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