

DIGITALLY INTEGRATED PRODUCTION

INDUSTRIE 4.0 AT FRAUNHOFER IPK



INDUSTRIE 4.0: DIGITALLY INTEGRATED PRODUCTION

AT A GLANCE

Industrie 4.0 at Fraunhofer IPK

Industrial production is currently undergoing the next big development step after the introduction of digital control technology in the 1950s and of computer-integrated manufacturing (CIM) in the 1980s: Production is becoming increasingly networked. In the factory of the future, all entities of production – from people through workpieces to machines and tools – will be connected by modern information and communication technologies, thus being able to communicate and cooperate directly. At the same time, production-related information will be available in real time and can be presented, viewed and exchanged anywhere within the plant as tasks and situations demand.

Such comprehensive integration opens up a multitude of possibilities to optimize production processes and to create flexible workflows. For instance, new forms of production organization can be designed where manufacturing will no longer be centrally organized, planned in advance and controlled. Instead, employees at all enterprise levels can assume greater responsibility for controlling the production sequence, while intelligent technologies support them in doing so. This will make it possible to realize individual cus-

tom requirements in a cost-effective manner – no matter if product characteristics or the manufacturing process are concerned. Ideally, developments will even allow small and smallest batch sizes to be realized without causing production costs to explode.

»Industrie 4.0« or »Integrated Industry« are buzzwords describing how factories will change into networked, intelligent and flexible manufacturing plants. First phrased in 2011 as a vision, now technological implementation of Industrie 4.0 has commenced. German industry's success will strongly depend on how fast individual solutions can be put into action. As a trailblazer of Industrie 4.0, Fraunhofer IPK is having a significant share in this process. Digitally integrated production has been our daily lived reality for years already. In transdisciplinary projects we network production; we make it intelligent and flexible. We find solutions manufacturing companies of all sizes can apply efficiently – even small and medium-sized enterprises. Additionally, in the near future an »Application Center Industrie 4.0« at our premises will offer companies a testbed to practically have a try at technologies for digitally integrated production.

VOICES ON THE TOPIC

A conversation on the digital revolution with the Chancellor



Dr. Angela Merkel and talked with her about the digital revolution in industry.

<https://www.youtube.com/watch?v=jZnYUkMkBT4>

In February 2015, Eckhard Hohwieler, head of the Production Machines and Systems Management department at Fraunhofer IPK, visited Federal Chancellor



Institute Director Prof. Uhlmann interviewed by RBB



scientific institutions in the capital. That is reason enough for RBB Inforadio to take a closer look at this buzzword – consulting IPK institute director Prof. Eckhart Uhlmann among others. <http://bit.ly/1LdJzUK>

»The term Industrie 4.0 means nothing to 80 percent of medium-sized enterprises«, says Stefan Franzke of Berlin Partner – first port of call for companies, investors and





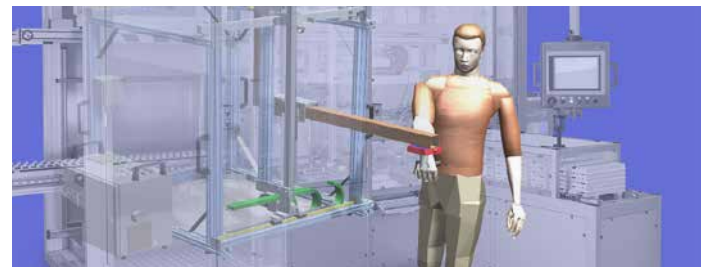
PROJECTS

IPK projects concerning Digitally integrated Production



Industry Cockpit – Opening the Way to Customized Processes and Products

Customer demands are increasingly making it necessary to adapt processes within companies to the customers' individual requirements or to supplement them with additional processes – from administrative procedures and additional inspection processes to individual shipping, acceptance and invoicing arrangements. The model-based »Industry Cockpit« was developed to reliably control and monitor such highly dynamic processes.



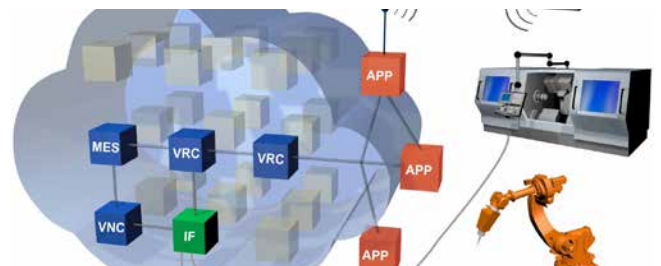
VIB-SHP – Virtual Kit for Plant Construction

Even though virtual procedures and »Simultaneous Engineering« are reckoned as established methods of product creation, medium-sized German plant manufacturers usually employ traditional development methods, proceeding sequentially. The collaborative research project VIB-SHP intends to optimize the production systems and plants development process with virtual technologies. At the same time, Industrie 4.0 requirements will be incorporated in the development process.



iWePro – Smart Workshop

Rigid production systems are increasingly straining at their limits – particularly in terms of their ability to respond quickly, their workloads and their ability to meet delivery deadlines. In the »iWePro – Intelligent Cooperation and Networking for Shop Floor Production« project, partners from science and industry are now designing innovative production concepts to enable smart shop floor manufacturing with decentralized production control.



pICASSO – Cloud-based Controls

Ever since the 1980s the IT structure of factories has been ordered hierarchically. Cloud technologies now make it possible to disengage these hierarchies and link up individual components. The collaborative research project pICASSO aims at using cloud technology to decouple software control functionality from the hardware to design adaptable industrial automation solutions.

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