

On The Way Towards A Digital Factory



It triggers the purchases of materials as well as it guides itself to the orderer. Sophisticated software works with high-tech machines. They agree on decisions together and reduce human errors. There is talk of a new industrial era, of industry 4.0 which combines the virtual and the real world of production. It means the complete reversal of the hitherto existing production logic, machines get connected to one another and all this is no longer done through a centrally controlled system, but happens on a totally autonomous way.

A digital factory – and human being as „Problem solver“ in the middle of it. „We are on a good way to make a reality of the digital factory“, says Prof. Michael Schenk, Director of the Fraunhofer Institute for Factory Operation and Automation (IFF). For many years, the Magdeburg-based research institute has successfully been developing digital technologies meant to be used in the overall production process. „Together with many companies, we have been able to make major achievements as to the establishment of

processes, technologies and applications of the digital factory. The result: enterprises keep witnessing enormous progress of productivity and efficiency“, states Professor Schenk.

Innovative, proficient, committed: so is the claim of the Fraunhofer IFF. Have a look into two „samples“.

Example 1. Should natural gas wells dilute, no gas would steam out anymore. Assistance could be given by a mobile free fall conveyor, as it has been put to use by the Fangmann Energy Services GmbH Co. KG, an engineering and plant construction company in Salzwedel. However, using it properly is not without danger. How can one's collaborators then be taught about handling it? In digital learning modules, they can be trained on installation and usage without harming themselves and the costly facility. For this purpose, researchers of the Fraunhofer IFF have created a learning application. The CEO Steffan Gerdes is enthusiastic about the issue: „The qualification of our colleagues is reaching a new quality now.“ Thanks to the three-dimensional presentation, they can virtually plunge into the facility and realistically train.

Example 2. In special-purpose machine engineering, programming and prior simulation of complex sequences of machine processes is a big challenge. In this respect, the company Sondermaschinenbau Calvörde which specializes on welding machines for large components in the railway vehicle construction got the Fraunhofer IFF on board. The Fraunhofer experts helped bring a complex spot welding machine with up to 16 CNC axes into service, this in a very short time and virtually in advance. With their digital engineering tools, the equipment constructors were able to program the machine before its construction via a real controller and carry out a completely virtual simulation of the complex running of the facility in real time. Beside the test carried out by the equipment constructor, it facilitates realistic dry runs for the subsequent operator without jeopardizing neither the machine, nor the material.

In Haldensleben, one can see how intelligent logistics functions. At least there where the company Hermes Fulfilment logistically handles a large part of the distance business belonging to the Otto Group and other external customers. The automatic return system (ARS) at the dispatch centre disposes of 175,000 bin locations for roughly one million items. The ARS is considered as the biggest warehouse of its kind worldwide. The bins containing items in mint condition are stored and brought to the workstation of the order picker, both automatically. For this, there are 840 shuttles spread over 30 lanes with 28 levels each. Up to 15,000 bins are on the move. The order picking output is around 200,000 parts a day. The ARS is the core part of the return management system; Hermes Fulfilment received in 2013 the Logistics Innovation Award of the Association of German Engineers.

The global economy is heading towards industry 4.0. The intelligent factory is pioneering it, and Saxony-Anhalt will have good opportunities thereby.

Author: Dana Kadell

Contacts:

Fraunhofer Institute for Factory Operation and Automation IFF
Sandtorstraße 22
39106 Magdeburg
Tel. +49 391 4090470
www.iff.fraunhofer.de

Fangmann Energy Service GmbH Co. KG
Brietzer Weg 10
29410 Salzwedel
Tel. +49 3901 83630
www.fangmanngroup.com

Sondermaschinenbau Calvörde GmbH
Am Grieps 2
39359 Calvörde
Tel. +49 39051 900
www.smcavoeerde.de

Hermes Fulfilment GmbH
Hamburger Straße 1
39340 Haldensleben
Tel. +49 3904 610
www.hermesworld.com

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