

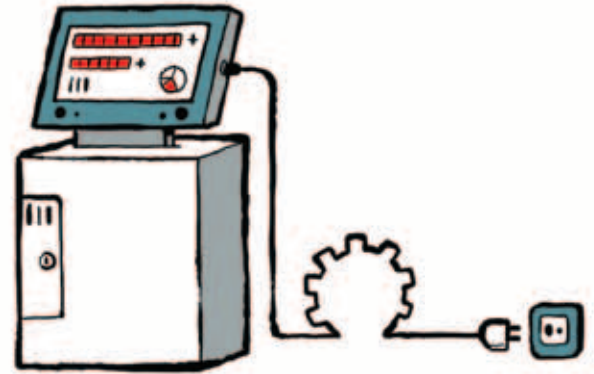
ARE VARIANT PRODUCERS THE PIONEERS?

Discussion between Johann Hofmann and Prof. Dr. Werner Bick
about the potential of Industry 4.0 solutions in practice



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A competition was organized for the first time by the trade journal Produktion and ROI Management Consulting AG in 2013 evaluating and rewarding practical Industry 4.0 solutions. ROI DIALOG spoke with the winner of the Industry 4.0 Award, Johann Hofmann, CAM Business Unit Manager at Maschinenfabrik Reinhausen and ROI's Chief Executive Officer Prof. Dr. Werner Bick, about business realities, IT strategies in production and the further evolution of Industry 4.0.

DIALOG: *Mr Hofmann, congratulations on winning the Industry 4.0 Award 2013. What are the reasons for your success? Did you have a strategic vision and a roadmap for developing your Industry 4.0 solution? If so, what exactly did it look like?*

JH: The vision originated back in 1989 during the 'CIM euphoria' and over the first 17 years was only used in production at Maschinenfabrik Reinhausen. In 2000 it first became possible to connect NC machines using networking and browser technology. This was the signal to transfer industry-tested processes to web-based technology and to offer them as fully scalable MR-CM® product to other companies. It is interesting to note that many of the characteristics of our solution can be found in the definition of Industry 4.0.

The special features of the intelligent manufacturing process in use with us today include the in-house developed data hub, full vertical and horizontal integration, complete digitalization of equipment and tools and the provision of all required data direct to the workplace such as tooling drawings, setup instructions, etc.

DIALOG: *Are 'smart factory' and networked production topics for all industries to the same degree or are there exceptions? What is your experience in this area, Professor Bick?*

WB: Digital interconnectedness is of particular benefit when it involves the discrete production of extremely customized, generally high-value articles, i.e. typically those that are in serial production but subject to large fluctuations in terms of volume and production mix where supplier and customer data systems need to be integrated into the value chain.

The main industries where this applies are, logically, the automotive and automotive supply industries as well as high-variant manufacturers in the mechanical engineering and electrical industries. Process-oriented businesses with less freedom of movement benefit less from Industry 4.0 solutions in the first step. This assessment also corresponds to the spread of highly innovative companies that took part in the Industry 4.0 Award. 40 % of businesses came from mechanical engineering, 30 % from the automotive field and 20 % from electrical engineering.

DIALOG: Can we therefore say that it is mechanical engineering with its wealth of product variants that will be – or must be – a pioneer and forerunner for Industry 4.0?

JH: Yes, because it is the wealth of product variants that results in frequent and costly retooling costs. Cost pressures, competition from low-wage economies, ever shorter product life cycles and increasing quality demands from customers coupled to the growing variety of variants among end products are turning the management and continuous improvement of their production processes into core competitive factors for manufacturing companies. The vision of Industry 4.0 takes on particular significance in this respect.

Production at Maschinenfabrik Reinhausen for the core business of tap-changers for regulating transformers includes high-performance production and assembly. Production is characterized by a large spread of customer requirements and low volumes. The main motivation for developing the award-winning solution were inefficiencies in the setup process, where the particular problem that occurred – not just at Maschinenfabrik Reinhausen – and what is generally encountered in any manufacturing using NC machines, was that the different machines involved in the production process, for example NC machines, tool presetters and storage systems, all use proprietary data formats making it impossible to provide standard process data across all machines on a regular basis.

DIALOG: How 'lean' are successful Industry 4.0 solutions then, or is there actually a contradiction here?

WB: There is no contradiction. 'Lean' is the basis for efficient value chains for companies. You can automate poorly coordinated processes but they will remain permanently poor and existing potential savings and productivity increases will not be achieved while costs for the automated solution will also rise.

This is very well illustrated by the example of Maschinenfabrik Reinhausen, where we find a very high degree of implementation of lean principles, from systematic reductions in lead times and zero defects (thanks to poka-yoke) to robust processes.



Prof. Werner Bick,
Chief Executive Officer, ROI
Management Consulting AG

DIALOG: One of the assessment criteria for the Industry 4.0 Award was also the benefits for customers, employees and society as a whole, for example through the more efficient use of resources or improved working processes. What was the experience you gained with regard to these topics?

JH: Our award-winning solution is a system from everyday practice for everyday practice, i.e. it was developed in collaboration with the machine operators. It frees up workers from error-prone and non-value-adding work and thus improves their daily work. Our solution creates happier and more satisfied employees

DIALOG: Let us take a look into the future – what will be the next steps in the evolution of Industry 4.0? And when will we start talking about Industry 5.0?

JH: The scope of Industry 4.0 is so broad that much of it will work while much of it will not and some of it will be implemented in a totally different way from what is forecast today. For example, the vision of a 'cyber-physical system' first requires 'cyber-physical logistics'. Before a workpiece can navigate its way

"Our solution creates happier and more satisfied employees"

autonomously through the production shops we must first clarify who will move the workpiece. In any case, Industry 4.0 will have a significant effect and bring about major changes – just like CIM. CIM is generally considered to have failed but I am still convinced that CIM has had a significant effect. Without the 'CIM wave' we at Maschinenfabrik Reinhausen would not be where we are today. Franz Kafka once said, "Paths are made by walking". That also holds true for Industry 4.0.

WB: I fully concur with you, Mr Hofmann. As long as Industry 4.0 remains just a vision in many areas and industries we do not need to speculate about '5.0'.