

TAKING A LOOK AT 'MAN-MACHINE-CO-EVOLUTION'

Interview with Heinrich Nottbohm, Head of the Chemnitz engine plant, Volkswagen Sachsen GmbH



DIALOG: *Mr Nottbohm, your plant in Chemnitz has a first-mover function within the Volkswagen Group. This also involves keeping a lookout for the opportunities presented by new technological developments. How high do you estimate the as yet unrealized potential of networked intelligent production for your factory?*

HN: We have already implemented the initial building blocks for the fields of action for Industry 4.0. We have already reached a reasonable level and are moving in the right direction. This, together with other unique features, justifies our first-mover role as worldwide type leader for Volkswagen's new generation of petrol engines.

The potential of Industry 4.0 is huge but not exactly predictable since it largely depends on the level of interconnectivity. While academic studies indicate a potential of 50 % for savings in development times and costs as well as for production costs, we estimate a somewhat more moderate potential, still in the double-digit percentage range, for our factory as an autonomous unit. It is a different picture when seen from a global perspective covering the entire production network, for example at Volkswagen. Here we expect a significantly higher benefit from networking thanks to an increased collaborative capability.

"The Chemnitz facility is 'on course' to becoming a smart factory"

DIALOG: *The path from a successful prototype to commercial series production is long. How do you currently assess the maturity of solutions that are being discussed under the term Industry 4.0? In which areas of the automotive industry do you expect its introduction*

first and where do you see the greatest obstacles to implementation?

HN: I already consider the maturity of individual solutions to be very high but I

see deficits in their interconnectedness. Generally speaking, some approaches that have been subsumed under the term 'Industry 4.0' are rather questionable and it is important to prevent the term being used in an inflationary manner and consequently with an increasing lack of transparency. This would dilute the subject matter and prevent the effective use of expertise.

The Chemnitz facility has set itself the goal of achieving universal implementation over the next five years. It is for this reason that we have embarked on a research project with a number of partners such as Chemnitz Technical University, machine tool manufacturers and other associated partners. We are planning additional sub-projects with academic partners and companies. I see the greatest challenge in preparing the 'flood of data' to be suitable for users in order to be able to have a positive influence on processes. This means, therefore, making relevant data available in real time and optimizing IT and infrastructure as services ('basis').

A global company also faces challenges in harmonizing and synchronizing systems and processes across locations. In addition, customized capacity planning and tailored staff flexibility are an important and yet difficult topic. We have, however, already begun to focus on these subjects.



DIALOG: *With all this in mind, is the Chemnitz engine plant already a 'smart factory'? What concrete examples can you draw on to back this up?*

HN: Here, too, I would ask for caution when using these concepts and first raise the question about the definition of 'smart factory'. A 'smart factory' has a number of dimensions such as smart products, smart buildings, smart logistics, etc. Thus 'smart' first of all means horizontal integration across value creation networks, and secondly the digital pervasiveness of engineering over the entire value chain, and thirdly, vertical integration and interconnected production systems.

I therefore stick to my statement that the Chemnitz facility is 'on course' to becoming a smart factory, which does not mean that all the aspects have yet been implemented from start to finish. The initial starting points at the Chemnitz location that in some respects give the factory the appearance of being 'smart' include the pervasive planning of processes using digital factory tools (such as ergonomic optimization tools), real-time monitoring of production equipment and the availability of production data for each engine and component or for all manufacturing processes

DIALOG: *Environmentally friendly and resource-efficient production is becoming necessary for the long-term viability of an industry, not just for social reasons but increasingly for commercial reasons. A great deal of work is being performed on this subject in the VW Group – and especially in your facility in Chemnitz. Where do you see further possibilities for improvement and what strategy do you intend to use to realize them?*

HN: Our company placed a strong focus on resource and energy efficiency at an

early stage with its 'Think Blue.' strategy. In this context it is worth noting that these efforts are not restricted just to our environmentally friendly, fuel-efficient products. Our focus also intentionally covers our operational locations. 'Think Blue. Factory.' is the name of the Volkswagen's program that is intended to reduce environmental impact in production on a sustained and continuous basis. With 'Think Blue. Factory.' we accept ecological responsibility and also achieve clear competitive advantage with sustainable production.

There are also additional pro-

"We make every effort to organize the connected and pervasive interaction of 'man and machine' efficiently around the world."

grams in the Chemnitz facility such as the so-called 'Total Energy Management' program as a holistic approach to factory planning and operation or the 'Clean Factory' concept that covers technical cleanliness and the use of resources.

I see the main potential of Industry 4.0 in the following areas: in pervasive transparency over consumption, for example electricity and water, in optimized monitoring and production processes – all the way through to the efficient use of resources – as well as in production technology all the way through to more efficient processing of e.g. the feed rate. This will allow the energy consumed for each operation to be reduced.

DIALOG: *The interaction between steel and IT works remarkably well in the final product such as the car. What do you see when you think of the associated forms of production in 2025 and what are you doing to become a pioneer of this vision.*

HN: This depends primarily on overriding social trends. In the same way that we have to effectively transfer the trend towards personalization and new patterns of mobility into our products, it will be similarly important to design production to

conform to the trends. We talk of so-called 'Man-machine-co-evolution' in the production world. What is meant is the interaction between employees and technical plant in the sense that the two aspects cease to develop independently of each other. Instead transformation will in future be subject much more to joint – as it were interactive – evolution.

In this respect we will do everything it takes, first, to design our products to be sustainable for the future – for the group as a whole – and second, to effectively organize the connected and pervasive interaction of 'man and machine' in cooperation with our more than 100 production locations. In the Chemnitz facility we are already making a groundbreaking contribution to this that is intended to secure our pioneer role over the long term.



Heinrich Nottbohm, Head of the Chemnitz engine plant, Volkswagen Sachsen GmbH