In your opinion, will increasing automation lead to the elimination of manual labor in factories? Voß: That depends on how you define the term factory. If we’re talking about a press shop in the automotive industry, such facilities are already highly automated. But that’s very different when you talk about a foundry line in the same industry, where fewer people work than used to be the case, but where the proportion of unskilled workers is still surprisingly high.

Manual labor will continue to exist — not only in the automotive industry, but also in the electrical and electronics industry, where people are needed to mount components on printed circuit boards or assemble cell phones. Manual labor is also required in the textile industry and in parts of the mechanical engineering sector, especially when machines have to be individually configured for each customer.

Is the vision of an automated factory realistic? Voß: What we will see — and what already exists — are sections of complex manufacturing facilities that operate with very few people. Certain flexible production systems today already have fully automated areas where processes have been standardized through implementation of networked computer numerical control machines. Still, even here there are people in the back-ground, such as technicians who monitor facilities and manage operations, waiting to intervene if something goes wrong. You may not see these people in the plant, but then there’s a problem, you’d be surprised how quickly they appear. You’d also like to point out that a large proportion of simple functions are invisible in many places because they’ve been outsourced around the world. In such so-called extended workbenches demonstrate that manual labor continues to exist.

Advanced technologies have created millions of new jobs around the world — but not enough jobs to offset very high levels of unemployment in some countries. Are our educational and training systems failing to provide the human capital we need? Voß: The advent of new technologies has repeatedly shown that attempts to replace human labor with machines lead to the creation of new jobs. The question is what kind of jobs are being offered. It’s very often the case that those who lose their jobs through rationalization problems. That’s because quality is a function that everyone is responsible for; it’s not something only production units need to worry about. What I’m talking about here is the value chain, and it’s becoming more and more important. Put simply, skilled workers in production have to keep the customer in mind as well, and when they do this, they become more than just workers who know their jobs. In this situation, they take a step toward becoming service providers who take the needs of customers into consideration when it comes to quality, price and on-time delivery.

Let’s look ahead and talk about the year 2020. Many experts predict down-sized factories and highly flexible production systems with lot sizes of one — in short, truly personalized products. Given these innovations, do you expect customers to eventually become part of the production process? Voß: Many industrial sectors already have production planning and control systems. Although the early euphoria that surrounded the introduction of computer-integrated manufacturing — or CIM — has largely dissipated, research in this area is moving forward. Interestingly enough, there are attempts these days to incorporate consumers into the production process through instruments such as mass customization, whereby customers formulate individual product demands and can even intervene in production by entering these demands into Internet systems. The goal here is to develop technical and organizational procedures that enable products to be individually manufactured at an affordable cost — and at the same time tailored to the needs of customers.

“Crowd sourcing,” which has become a subject of much discussion, goes even further by envisioning an interactive Web 2.0 that allows customers to be incorporated into business processes by contributing their wishes, ideas, and even suggestions for improvement and new designs. This is also known as Pro-Am cooperation, which means professionals and amateurs working together — and doing so even in the production of complex products such as automobiles and electronic equipment. We’re talking about much more here than selecting models, colors, seat coverings or optional equipment. In this approach the product is manufactured down to the last detail in accordance with the customer’s wishes. In some cases, this could have a big impact on the entire production process as well.

Interview conducted by Eveloa Taskinou