“Industrie 4.0” – An export driver for Europe

by Joe Kaeser

The Hanover Fair, which has now opened its doors in Germany to hundreds of thousands of visitors from all around the world, is a barometer of global economic trends. This year, the fair is dominated by one topic: “Industrie 4.0”.

Today, we’re on the threshold of a new industrial revolution – a revolution in which digital networks link value chains in intelligent factories and encompass everything from the initial idea, the design, development and manufacture of products, all the way to maintenance, services and recycling.

Like its three predecessors, this fourth industrial revolution – Industrie 4.0 – will usher in a new era of manufacturing. The introduction of the steam engine in the 18th century, the introduction of the assembly line in car factories by Henry Ford a hundred years ago and the introduction of IT and computer-controlled systems in the last decades of the 20th century all fundamentally changed the working world. This revolution will be no less transformative.

Industrie 4.0 involves the horizontal integration of data flows among partners, suppliers and customers and the vertical integration within organizations – from development to the finished product. It merges virtual and real worlds. The result will be a system in which all processes are fully integrated – a system in which sensors and chips identify and locate products and in which products know their own histories and current status. And this network of machines, warehouse systems and production facilities will exchange information in real time.

The speed of change in consumer trends will be a significant driver of Industrie 4.0. The time between product generations is becoming shorter and shorter. Customer preferences can change while the ships transporting the current generation of products are still at sea. And this applies equally to running shoes, t-shirts, electronic devices like smart phones and other products that are influenced by fashion and consumer preferences.
With products being configured to meet the preferences of individual customers, production must become more flexible – without taking more time. It’s about creating value for customers. And that means getting them involved right from the start.

Clearly, companies that use highly efficient mass production to achieve economies of scale and at the same time have the capability to offer a high degree of customization have a competitive edge. Just consider the auto industry: even today virtually no two vehicles coming off the assembly line are absolutely identical. And carmakers are already enabling buyers to configure and order the car of their dreams with the click of a mouse. I can’t imagine tomorrow’s customers being willing to wait months for delivery. That’s why global production networks in the car industry have to be designed to react instantly to the volatility of individual markets, for example, to switch production from one model to another in a matter of seconds if that’s the model the customer ordered.

This is where Industrie 4.0 can make a major contribution. Digitization alone can cut time-to-market in half, while engineering efficiency can be increased 30 percent. In other words, to stay competitive in the world market, companies have no choice but to upgrade their operations.

All this will not happen overnight. It will be a gradual process that will probably take 20 years to complete. However, the groundwork starts today. Many elements of Industrie 4.0 are already available. Take, for instance, Sebastian Vettel’s Formula One racecar and the Mars rover “Curiosity.” Both already have been – or are now being – developed in the virtual world with the help of product lifecycle management (PLM) software, rendering months of practical tests unnecessary.

Many wonder how Industrie 4.0 will change the working world. Will it be a world of soulless manufacturing? Will it be a world like the one depicted in “Modern Times,” Charlie Chaplin’s classic critique of assembly line work?

No, it won’t. The cogwheels of machines won’t be gobbling workers. Human beings won’t become superfluous. On the contrary, it will be the skills of humans that will shape the interface between man and machine. Like all the others, the fourth industrial revolution will be human-made.

And I’m certain that it will also create jobs. But we have to be clear about one thing. The jobs and the qualifications required tomorrow will be totally different from those required today. Future generations will have to be qualified in new ways; they will have to be willing to constantly retrain. That will require rethinking. Already today, schools, universities, and companies must take a much more interdisciplinary and network-oriented approach. Why? Because the industrial worker of tomorrow will also have to be a software specialist: he or she will have to understand the entire value chain.
Germany is ideally positioned to master this transformation. It has a strong industrial base and a dual education system that is the envy of many other countries. In addition, German companies have a high level of expertise in production and factory processes and in digital networks. Take for example Siemens: with around 17,000 software engineers globally, it’s already at home in the virtual world.

What applies to the past often applies to the future: If you stand still, you’ll be left behind. I’m convinced that Industrie 4.0 will inspire innovation – and not just in startups, family-run businesses and large companies in Germany but in enterprises all over in the world. Even if the new world of Industrie 4.0 is still a vision – it’s a vision with the potential to become an export driver not just for Germany but also for the whole of Europe.

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