

# SMART ENGINEERING: THE IMPACT OF INDUSTRY 4.0 ON PLM

Industry 4.0 offers companies considerable opportunities but also presents new challenges. Without smart connected products, there can be no digital factories and also no digital transformation of business process and business models. The development of smart products requires the intelligent linking of engineering processes across different companies and across different domains. That is what we mean by „Smart Engineering“. A prerequisite for Smart Engineering is an overhaul of existing PLM architectures and end-to-end digitalization of the entire product lifecycle.

This white paper describes the challenges posed by Industry 4.0 when it comes to PLM processes and systems and presents you with possible approaches for mastering these challenges.



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## Preamble

Industry 4.0 challenges the status quo and creates new opportunities as a result of the digital transformation of business processes and business models. Humans, machines, systems, logistics and products will be able to communicate and collaborate directly with one another. Development processes, production processes, logistics processes and service processes in companies and between different companies will be intermeshed intelligently, making end-to-end processes even more flexible and efficient. This revolution presents companies with an opportunity that they cannot afford to overlook.

But what impact will these changes have on the processes, methods and IT systems in product development and engineering?

What challenges and opportunities will they bring?

What strategies and approaches will provide a means of mastering the challenges and exploiting the opportunities?

This white paper, entitled „Smart Engineering: The Impact of Industry 4.0 on PLM“, takes a look at the impact that Industry 4.0 will have on future engineering and PLM processes and draws conclusions as to the further development of PLM. The challenges and opportunities are then placed in the context of the range of consulting services that PROSTEP AG currently offers.

Industry 4.0 and the associated digital transformation will bring about dramatic changes for our customers. Thanks to our wide-ranging consulting expertise and our many years of experience with PLM integration and implementation, we are fully equipped to provide you with support you need. Our involvement in numerous of the ProSTEP iViP Association's research projects and initiatives means that we are always at the forefront of innovation.

It is no coincidence that our motto is INTEGRATE THE FUTURE.

Bernd Pätzold



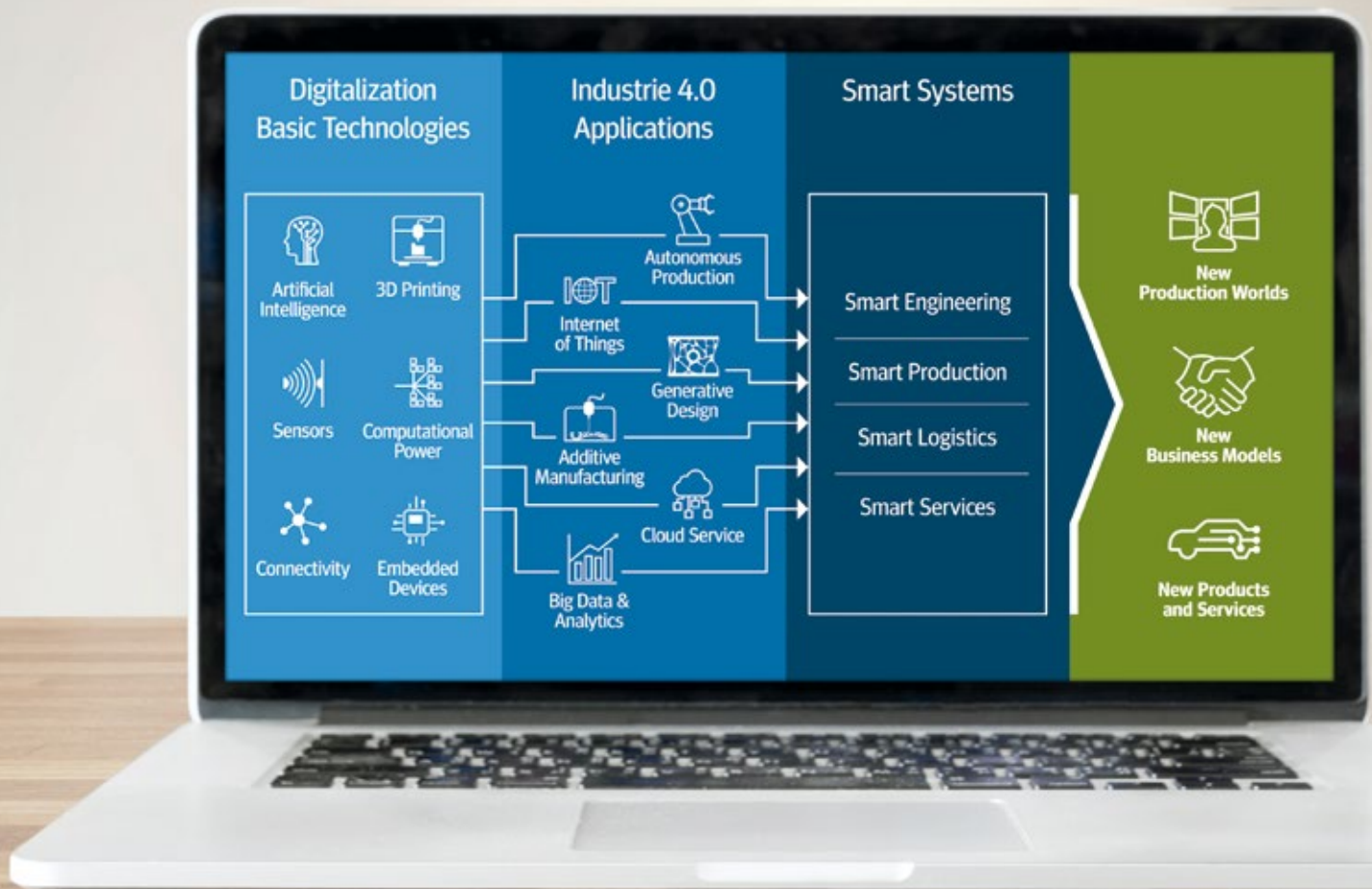
# The challenges posed by Industry 4.0 and Smart Engineering

## Industry 4.0

In a wider sense, Industry 4.0 means the intermeshing of the value chains in development, production, sales and service using state-of-the-art information and communication technologies. The force driving this development is the increasingly rapid digitalization of business and society. It will fundamentally change the way we develop, manufacture and work in the future: First came steam engines, assembly lines, electronics and IT, now it is smart production, smart engineering and smart services that are driving the fourth industrial revolution.

What are the key basic technologies involved and what impact will they have on future business processes and business models?

Figure 1



The technical foundation is provided by new, inexpensive and powerful technologies in the fields of sensor technology, embedded systems, artificial intelligence, networking and 3D printing, among others, combined with the huge increase in available computing power (see Figure 1).

These technologies make smart, connected systems with largely self-organized production possible: humans, machines, systems, logistics and products communicate and collaborate directly with one another in the age of Industry 4.0. Development processes, production processes, logistics processes and service processes in companies and between different companies will be intermeshed, making end-to-end processes even more efficient and flexible.

This will give rise to integrated, interlinked value chains that include all the phases of the product lifecycle – from the initial idea for a product to its development, manufacture, use and maintenance through to recycling. On the one hand, this will make it easier for customers to contribute their own wishes and, on the other, for companies to be able to manufacture products that are tailored to the customers' individual requirements. Customized manufacturing and preventative maintenance of products can become the new standard.

These options will give rise to new business models. At the same time, the speed of this transformation and the resulting competitive pressures for established companies will increase further.





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