

Chapter 1

Industry 4.0:

Nothing Is More Steady Than Change

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ABSTRACT

The term Industry 4.0 was born in the research group of the German federal government as well as in a project of the same name from the high-tech strategy of the federal government. It is meant to describe the interlacing of industrial production with modern information and communication technology. A key success factor and a major difference to computer-integrated manufacturing (according to Industry 3.0) is the use of internet technologies for communication between people, machines, and products. Cyber-physical systems and the internet of things (IoT) form the technological basis. The objectives are essentially the classic goals of the manufacturing industry, such as quality, cost and time efficiency, as well as resource efficiency, flexibility, convergence, and robustness (or resilience) in volatile markets. Industry 4.0 is one of the core themes of the federal government's digital agenda.

ECONOMIC DEVELOPMENT SINCE 1990

An old proverb says: Nothing is more steady than change. And in our present day, this sentence seems to be more valid than ever: The East-West confrontation, which dominated the world after the Second World War, has been replaced by a political and above all economic globalization. Across the globe, this fundamental change has led nations, economies, and organizations to adapt their own strategies and orientations according to the changes. This gave rise to new forces, which also dramatically influenced cooperation between the individual partners. For decades,

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Figure 1.



the political and economic leadership role in the Western world was considered a given. Today, however, this is anything but self-evident. The Third World, marked by industrializations in the 1970s, metamorphosed into a political and economic partner of global importance. The individual economic regions then changed very differently. In this respect, a graphic by the VDMA / OECD of January 2013 is very revealing (VDMA, n.d.): According to it, Germany and Austria are the only leading industrial nations in the Western world who have been able to maintain the share of the manufacturing sector over the past 20 years. Since the 90's of the last century, Germany has been confirming its share in the producing sector between 25% and 30% in the gross national product (VDMA, n.d.). Austria is just behind with 23% to 25%. This is particularly noteworthy as the economic slump of the two countries triggered by the banking crisis in 2008 had already been overcome by 2011. The only other country to achieve this was the United States of America, albeit at a much lower level. All other industrial nations, however, are now levelling in on the 10% mark. Internationally, this trend motivated abolishing the manufacturing industry. Many industrial nations, therefore, depended on financial services and production took place where it was more affordable. Industrial equipment, expertise, and employees were therefore reduced. In Germany, on the other hand, the manufacturing sector remained a very important economic factor. The German industry kept the production largely in its own country and stepped up to automation in response to increased wage and production costs. Here, too, it led to a comprehensive structural

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