Expert Insights

Social Innovation in a Digital World: the Fourth Industrial Revolution

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Henning Kagermann is President of Germany's National Academy of Science and Engineering (acatech). He received a doctorate degree in theoretical physics in 1975 at the TU Braunschweig and became a professor there in 1980. In 1982, he joined SAP GmbH (currently SAP SE). From 1998 to 2003, he served as co-chairman of the SAP Executive Board and CEO.

In 2015, the Internet of things (IoT) consisted of about 15 billion connected devices. The data gathered by these smartphones, radio-frequency identification (RFID) chips, and wireless sensors is fuelling web-based services that have disrupted sectors such as transportation and media. But the big changes are yet to come. In 2020, we expect there to be more than 30 billion connected devices. By then, companies in established industries such as automotive, energy production, and engineering will have to adapt to digitalization—or they will lose out to a new breed of Internet-savvy companies. What sets these newcomers apart is their ability to collect customer and product data from heterogeneous sources and use it for innovative business models that focus on customer needs and usability.

In Germany, this digitalization and the challenges it brings became known as Industrie 4.0, a term coined by an alliance of experts from industry and academics gathered by acatech, Germany's National Academy of Science and Engineering. We chose the version number 4.0 back in 2011 because we believed that digitalization and the IoT was initiating a fourth industrial revolution. Did we exaggerate? I do not think so.

So far, industrial revolutions triggered by the steam engine and, later, by electrification and industrial automation have mostly addressed our physical limitations. Digitalization, however, helps us overcome our cognitive limitations. By providing us with near-ubiquitous data, it allows for a much deeper understanding of the world around us. On a more pragmatic level, it enables companies to provide products and services tailored to the needs of individual customers but produced at the cost of a standardized mass-marked equivalent.

Hitachi is well placed to profit from this transformation. Its Data Systems subsidiary is reinventing itself as a big data consultancy that can distil business value from clients' data streams. While Hitachi, the globalized conglomerate, has access to huge amounts of real-time data through its vast offering of products and services in varying industries. Still, Hitachi like many other German industry giants would be ill advised to go it alone.

Web-based services need a specific environment to become economically successful: a huge market that allows rapid scaling, a set of standards for data interoperability, a legal system that protects both privacy and intellectual property rights. This is why acatech started looking beyond Germany and the needs of our national industry. In our project Industrie 4.0 Global, we are interviewing industry representatives and researchers from Japan, China, South Korea, the UK and the United States. I was grateful to speak with Hitachi, Ltd.'s Chairman of the Board Hiroaki Nakanishi about his vision of this global transformation.

The final results are not out yet, but we already see a trend emerging: Success in Industrie 4.0 is not so much a question of geography than of company size. While big firms like Siemens, Bosch, and Hitachi have invested heavily in Industrie 4.0, small and medium-sized enterprises (SMEs) are hesitating. They are falling behind. This is problematic because SMEs are very important for employment, national income, and as suppliers for many globalized corporations. No matter whether you call it the IoT or Industrie 4.0—it is not just about connecting devices, it is about connecting people and economies.