

## **Shaping the Digital Future in Education – Together**

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**Abstract**—The theme of ICL2017 conference of the International Society for Engineering Pedagogy held in September was “Teaching and Learning in the Digital World”. The topic is particularly relevant today as digitalization – together with globalization, urbanization, demographic changes and climate change – has become one of the megatrends shaping our world. Between 2000 and 2014 globalization almost doubled the volume of the world commerce. By 2050 70% of the world’s population is expected to live in cities. Digitalization influences practically everything, global economy – from industry through healthcare – and also our society. The world has never been as connected as now.

**Keywords**—digitalization, education, innovative solutions, future generation

### **1 The importance of going digital**

Digitalization is the process that turns activities, information and results into data that can be compiled, analyzed and shared. Data has become economy’s most important asset and its volume is constantly increasing. According to analysts the volume of digital data available worldwide is set to grow tenfold between 2013 and 2020.

A growing number of devices allows users to track various processes, also via the Internet. Whether in factories, rail and traffic management systems or decentralized power distribution systems, the trend is toward networking individual devices with entire systems – a process that is based on the integration of the physical world with the virtual world of data. Siemens calls this the Web of Systems. Cities and organizations need to harness the advantages of digitalization and integrated data.

Linking the real world with the virtual world of data offers several advantages. Digitalization enables faster development processes, more flexible production technology and increased efficiency of the use of resources. As a result manufacturing costs can be significantly reduced while quality and reliability increase and processes become more sustainable.

Digitalization changes the world, and only companies who can leverage from these changes and develop the right business models can stay ahead of competition. The key to a successful business in the digital future will be the ability to collect, integrate and share data that allows systems to optimize and efficiencies to be achieved.

## **2 Creating value through innovative solutions**

Recognizing the potential of digitalization, we at Siemens use the possibilities of the digital world to continuously improve our products and solutions for the benefit of our customers.

The advantages of digitalization are most apparent in our Product Lifecycle Management (PLM) software, which enables our customers worldwide to efficiently and cost-effectively manage all the information for the entire lifecycle of a product. PLM provides for a coherent data structure by consolidating systems. But it also makes it possible for companies operating globally to develop, manufacture, and launch products as a team while documenting best practices and any knowledge gained. This means that processes are not only depicted digitally, but that digitalization is what makes them possible in the first place.

We are also working intensively on other digital technologies. With MindSphere, Siemens interlinks physical products and production facilities with digital data, thus making it possible to bring products to market more quickly and more efficiently, with better quality.

Designed as a cloud-based, open operating system for the Internet of Things, the platform combines device management, simple connectivity, the necessary data storage, and the corresponding infrastructure to perform virtualized data management that can be deployed in the shortest time. Companies can use it as the basis for their own digital services. MindSphere also forms the basis for data-based services from Siemens, including the predictive maintenance of machine.

## **3 Investing in future generations**

As the need for technology companies to strengthen their innovative power increases, the connection of industry and academy becomes more important. New talents play a key role in establishing a fresh, innovative mindset. An important part of Siemens' corporate culture is to support the professional development of next generations and promote research and recruiting activities.

Since 2012 Siemens Professional Education offers training solutions in Hungary combining theoretical study, applied learning, and on-the-job experience in order to provide opportunities for talented students.

The Siemens Vocational Training Structure and Dual MSc Degree Program include job-specific knowledge taught in a specialized field, both at local universities and in-house at Siemens. Applied learning focuses on the development of knowledge and skills by experimental approach in training center environment, adding further competencies such as social or individual. Career-oriented practical and methodological knowledge can be gained during the on-the-job experience, where students work on real projects at host-department supported by instructors. Through this educational approach young talents gain both, theoretical and practical experience, which provide a solid base for their professional life.

Supporting the cooperation between industry and the research and university spheres is the goal of the Industry 4.0 National Technology Platform too, in which Siemens also participates. To make the leap to the 4th industrial revolution of digital factories, and to boost Hungarian competitiveness and transform the basics of local production and logistic systems, working groups were established within the platform. These working groups consist of participants with special expertise in a given area who work closely together with governmental forums. Siemens is contributing to a number of working groups, such as Industry 4.0 Cyber-Physical Pilot Systems, Manufacturing and Logistics, and based on our commitment to future generations, Employment, Education and Training.

#### **4 Author**

**Dale Andre Martin** is CEO of Siemens Zrt. (51-57 Gizella str., 1143 Budapest, Hungary), joined Siemens already in 1991 as CFO of the Siemens Telecommunications entity in Hungary. Thereafter he held various positions such as CFO of Siemens Hungary (concurrently also CFO of Hungarian Cable Works), later CFO of Siemens Healthcare Japan and CFO of Siemens Slovakia, prior to moving to his current position in 2010. He was elected President of the German-Hungarian Chamber of Industry and Commerce (DUIHK) for the first time in May 2013 and was reelected twice.

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