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Leveraging Industry to Prepare Students – A Reflection

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Abstract

Digitalization is changing everything in our world. The products that are manufactured today are much more sophisticated than 35 years ago when I entered the workforce as a mechanical engineer in the automotive sector. Today, industry is demanding new employees who can be productive their first day on the job. Current employees need to continually evolve their skills to meet the challenges imposed by Industry 4.0. In addition, the population is aging and retiring, taking with it the knowledge and experience that industry needs to innovate and thrive, and in many cases, survive.

As one of the world's top ten software companies and leading technology manufacturers, Siemens is committed to advancing education and workforce development. Siemens wants to help universities develop talent to fill the growing skill gap, as well as share our experience with real use cases that embrace digitalization and the digital twin.

Four years ago, I decided to change my role in industry to enter the academic world. I felt it was a good way to wrap up my career, by bringing some of my experience to the next generation of engineers who are entering the workforce. As part of Siemens Digital Industry Software, I have had the privilege of working with several universities to implement change. Now with my retirement only a few short months away, this presentation is an opportunity to share some insight and an example of how industrial software can be leveraged in engineering curriculum in a meaningful way.

The example I will share is an approach that was developed to fully utilize the power of simulation technology, as part of an ecosystem, in order to greatly enhance the engineering education process. Core courses were identified, and digital tools were systematically integrated across the curriculum to expose students to simulation techniques from the freshmen through the senior year. Students utilize the software in design courses to conduct projects, with higher level simulation techniques taught in senior or dual level courses that many undergraduate students take. Students are also introduced to manufacturing processes, including additive, through case studies of real-world parts to help them understand process planning as well as the specific steps and process parameters required for making a complex part.

Through this method, both theoretical knowledge and the simulation techniques students learn are systematically reinforced throughout the curriculum. By graduation, the students become highly capable engineers equipped with strong fundamental knowledge and proficient in simulation technologies.

Keywords
Industry 4.0, Digital Twin, Simulation, Curriculum

Biography

Gil graduated with a BSME from Purdue University in 1985. Upon graduation, he worked for General Motors, starting his career at the CPC Powertrain Manufacturing site in Pontiac Michigan. His first assignment was to develop a test stand to measure engine noise in the factory. After 4 years in manufacturing, he moved into product engineering, focusing on powertrain noise and vibration development. During this time, he received his MSE degree in 1996 from Purdue University with a focus on mechanical sciences. In 1998, Gil changed his career path to join a small software

company, LMS International, as a sales engineer. As a senior account manager, he was responsible for managing the Asian Automotive OEM's based in the US, including Honda, Toyota, Nissan, and Hyundai, with a focus on selling highly technical solutions and services for NVH, ride & handling, durability, and system development. Gil remained in sales after LMS was acquired by Siemens in 2014. In 2016, he left corporate sales to finish his career in academia. Over the past 4 years, he has been a program manager with the strategic university program. In this current role, he works with academic partners of Siemens to promote curriculum change and workforce development to address the needs of industry.