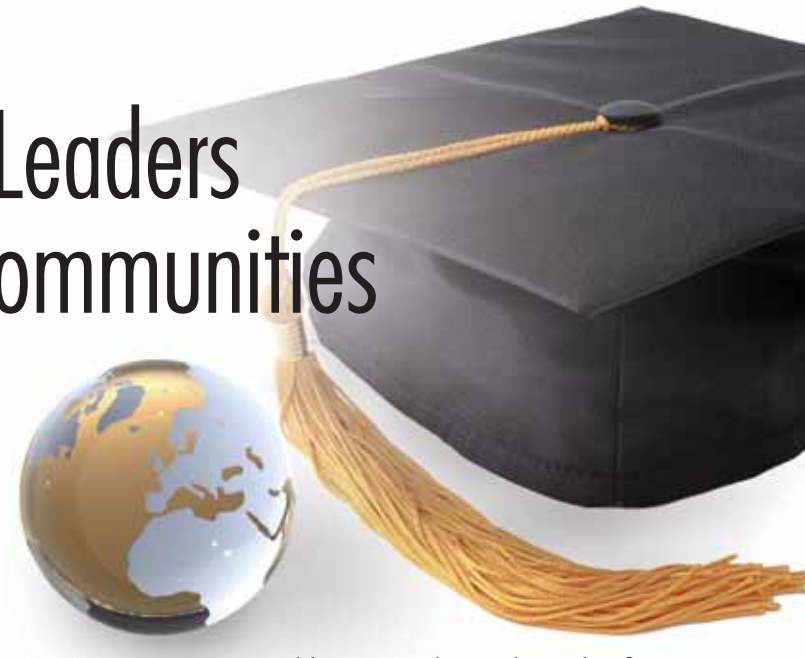
Developing Technical Leaders through Knowledge Communities



Knowledge communities will better prepare students to become team players and problem solvers.

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Today's college freshmen will enter the workforce in the 2010-2011 time frame. By then, chip manufacturing will be at the 32-nm technology mode, allowing manufacturers to build single chips that contain tens of billions of transistors.

FPGAs will be the leading platforms leveraging this manufacturing technology, capable of implementing programmable systems that will comprise nearly 100 million programmable logic gates. As such, the FPGA will become the heart of many electronic products.

The main building blocks that will make up a system in an FPGA will be soft processors running complex embedded software; highly parallel or pipelined arithmetic functions executing real-time signal-processing algorithms; packet-processing engines securing embedded connectivity; and complex hierarchies of memories handling efficient data transfer and storage mechanisms. These programmable systems will be adaptable and partially reconfigurable in the field.

Triple play (the convergence of data, voice, and video over a peer-to-peer network) will be the driving force setting the requirements for these platforms. The pace of this evolution, however, leaves very little time to educate today's students so that they become tomorrow's technical leaders. The challenge and complexity of this task by far exceeds the capacity and domain of a single professor.

Knowledge Communities

For this reason, industry and academia have come together to create "knowledge communities" around specific technology domains. Universities seek to create a wide association of people with common technology interests who wish to continue learning, enhancing the skills of their members and preserving lessons learned. The industry wants to be an active partner, educating those in academia in global system issues and creating a realistic agenda through intensive dialogue between industry leaders and visionary academics.

As these knowledge communities take hold, students will be better prepared to become the team players and problem solvers for future industry projects. Gradually, they will ascend the "knowledge value chain," from reproducing textbook content to applying judgment calls in situational problems.

Xilinx is constantly deepening its partnership with academia and is committed to jointly developing new ideas and opportunities and solving key challenges.

Triple play will permit FPGA platforms to become the core infrastructure; however, there are challenges to solve. First is the further digitization and processing of signals with growing resolutions, requiring an exponential growth in DSP compute capability. Second is the secure and reliable transport of this data with increasing bandwidth over wireless and wired infrastructures. And third is the need for high-performance computing to extract information from large amounts of raw data.

For example, the RAMP research community (*http://ramp.eecs.berkeley.edu*) is exploring a programming environment based on the BEE2 FPGA platform. The NetFPGA platform (*http://yuba.stanford.edu/nf2/*) provides an open platform for research on high-bandwidth networking applications. And the WARP project (*http://warp.rice.edu*) has built a repository to support complex wireless DSP application designs.

These activities are part of the Xilinx university outreach program, supporting continuing education and research based on our latest technology. The Xilinx University Program (XUP, *www.xilinx.com/univ/*) not only allows easy access to Xilinx best-in-class tools but also provides free training, high-quality support, and curriculum development assistance. XUP donations take many forms, from design software, FPGA devices, and IP cores to reference designs and student competitions.

As a business that is continually looking globally for new ideas and technologies, Xilinx has established relationships with a large number of universities around the world to allow their engineering students to receive hands-on experience with our technology. These students will enter the workforce with the necessary skills to be quickly productive in the fast-paced world of semiconductors.