

# Driving meta-innovation worldwide

**T**HE 14 VIGNETTES THAT THIS SPECIAL issue presents provide valuable insights into how you can develop innovative products, and they touch on the changing nature of engineering in today's world.

But what of the future of innovation? Perhaps innovation itself needs an overhaul. *Innovation* is easy to define: the introduction of something new. But perhaps we need to expand that definition or to introduce a different term—possibly *meta-innovation*: the deployment of an innovation where it has not been deployed before. Or as an alternative: the advantageous redeployment of an ancient innovation that has fallen out of favor.

The need for these new definitions occurred to me while listening to a keynote speech titled “The Dreams of Engineers: What’s Next?” that Geoffrey C Orsak, dean of the Southern Methodist University School of Engineering, presented at a conference on mechatronics (sponsored by *EDN* and sibling publications) held May 13 in Santa Clara, CA.

As an example of redeployment of ancient technology, Orsak cited SkySails ([www.skysails.com](http://www.skysails.com)). Years ago, people abandoned the use of sailboats for commercial shipping, he said. SkySails’ engineers, although not eliminating petroleum propulsion systems, have developed an innovative wind-powered enhancement that can cut shipping fuel costs by 10 to 35%.

But the main focus of Orsak’s keynote was the need to deploy existing technologies in places that thus far have not benefited from them. He set up his argument by citing the great innovations of the last century, such as electrification: In 1903, the first steam turbine-powered generator produced 5000 kW; in 1955, Arco, ID, became the first town to have nuclear power meet its energy needs; and in 1959, in New Zealand, the first large geothermal electricity-generating plant opened.

Yet, Orsak emphasized, today, after more than a century of innovation, 1.6 billion people worldwide have no access at all to electricity. “We as engineers accepted the fact that we were only going to have an impact on three-fourths of the world,” he said, adding that we concluded, “That’s good enough.” Orsak

said, “What we choose not to work on is as important as what we do choose to work on, and in the last century we chose not to provide electricity to everyone. Engineering and technology have been one of the greatest drivers of durable social change. Yet over the last century, engineering and modern technology have only had a minimal impact on the global poor.”

To address the unequal deployment of engineering’s fruits, Orsak called for a “new engineer”—one who retains the strengths of the past, which gave us electrification, the automobile, the airplane, and the laptop, but who can play an expanded role. “Engineering isn’t a gadget discipline,” he said. “It’s a people discipline.”

But this people discipline will require people skilled in its arts, and attracting enough young people to the field is a struggle. Orsak cited an example from his home state: Out of 100 ninth-graders in Texas today, 62 will graduate from high school, 32 will enter college, 11 will earn a degree, and only one will earn a technical/engineering degree. US schools, he said, are “squeezing out the love to innovate.” Students have “more technology in their backpacks than it took to get to the moon, but they don’t care.”

Orsak cited innovative efforts to address the shortfall of engineering students, including the establishment of the Caruth Institute for Engineering Education ([www.smu.edu/caruth](http://www.smu.edu/caruth)), which is dedicated to developing programs that encourage kindergarten through college students to pursue engineering careers.

Orsak suggested a lack of interest in innovation isn’t restricted to students but rather pervades US society. He quoted from John F Kennedy’s September 12, 1962, speech: “We choose to go to the moon in this decade and do the other things, not because they are easy, but because they are hard.” Orsak’s response: “Can you imagine any candidate saying that this year?” The will to do the hard things is not a part of who we are as a society today, he explained.

But for those individuals still willing to undertake the hard things, Orsak had this advice: “Don’t fall in love with your technology. Love the impact of your technology.”

—Rick Nelson



**meta-in·no·va·tion** \ n. **1.** The deployment of an innovation where it has not been deployed before **2.** The advantageous redeployment of an ancient innovation that has fallen out of favor