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Thrive, Don't Just Survive, Says ARM's Chairman

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SCOTTSDALE, ARIZ. -- Thanks to a solid foundation with ever-new challenges to overcome, the semiconductor industry continues to provide more and more exciting things to do with the transistor, waxed Sir Robin Saxby, chairman of ARM Holdings plc, during a keynote address today at the annual Semico Summit, being held here.

Saxby, a self-proclaimed optimist, who is also deputy president of the IEE organization as well as visiting professor at the University of Liverpool, explained that since 1947 when the first transistor was developed at Bell Labs, the first IC was created at Texas Instruments in 1958 to the genesis of standard MOS technology by Fairchild in 1967, semiconductor technology development has gained a strong foundation.

Then in the 1970s, Saxby reminded the audience of the waves of products that made their entry such as microprocessors, digital signal processors, DRAM and EPROM further cementing the technology's underpinning.

With decades of R&D to grow on, the 1980s and 1990s brought industry growth as well as the scaling in computing power and the move to multi-processing, using the evolution of Intel processors to illustrate: in 1982, Intel's 80286 contained 134,000 transistors, operated at 12MHz in a 68.7 square millimeter package. By comparison, in 2000, the Pentium4 contained 42 million transistors, operated at 1.5GHz in a 224 square millimeter package.

Saxby said that while Intel was scaling its microprocessors for performance, scaling could also be accomplished for power and area as well. In 1986, the ARM1 core was targeted for a 3-micron process with 2 metal layers, contained 25,000 transistors and measured 50 square millimeters, and today's ARM7TDMI core targeted at a 65nm process with 4 metal layers, 100,000 transistors and measuring less than 0.1 square millimeters.

In this vein, the financial benefit of scaling can be characterized by a virtuous cycle of demand, investment and cost reduction – each one driving the next.

At the same time, he said, scaling has enabled huge changes in consumer "gizmos." While computing has evolved in parallel with the semiconductor market over a similar but slightly longer period, semiconductor technology has enabled computing to be embedded into home and personal products.

Saxby also noted that technology has become a feature in applications such as automotive since today, digital electronics are becoming really useful in many applications, but that the most useful (and most valuable) technology is less intrusive.

Another dynamic that is continuing to propel market growth is that the pace of change is accelerating, he explained. Compared to the black and white TV, introduced in the 1930s and took 20 years to reach 1 million units shipped, DVD players were adopted by consumers so quickly that it took less than a year to reach 1 million units shipped. For the semiconductor provider, that fast adoption means fast time-to-market along with a quick ramp-to-volume.

Looking ahead to 2015 and beyond, Saxby believes digitization and non-intrusive technology will create new markets for semiconductor products with consumer products that have shorter shelf lives, driving the need for standard products and design for reuse.

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