Nick Tredennick, computing in transition

Contributed by Maciej Bajkowski
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A few weeks ago Nick Tredennick published a rather interesting analysis of the current state of the semiconductor market, titled Computing in Transition. Now why would you care about what Nick has to say about computing? Well, let’s say he has been around the block a few times. He worked on microcontrollers for Motorola in the late 70s, and then worked on the design of the Micro/370 microprocessor at IBM in the eighties before becoming the director of product development at Nexgen, followed by a quick stint as the chief scientists at Altera in the 90s. Currently he holds the president post at Tredennick Inc., a company specializing in consulting for full-custom and semi-custom VLSI designs. And if this were not enough, he also is an editor for the Glider Technology Report. As you see, when Nick publishes a presentation it is probably worth reviewing to get a viewpoint from an industry veteran.In his latest presentation the premise is that the microprocessor in essence stalled innovation in logic design since it allowed programming to become a substitute for logic design. This held true as long as the design goal was defined by cost-performance. However, more recently with the introduction of power constraints the design goal has been modified to be cost-performance per watt, leading to multi-core chips. As such, the computing market is in a transitional phase, however, where exactly it is heading is rather hard to predict. What might help therefore is an analysis of where the industry has been and where it is now.Here Nick digs up some very interesting facts and charts: For example, while it seems that companies are shipping millions of chips yearly, the semiconductor market accounts for less than one percent of the gross world product (GWP). At least the semiconductor market is growing at about twice the rate of the GWP. How is this for another interesting prediction: Unlike technology pundits who like to predict future killer applications that will take the market by storm, Nick has a rather simple prediction: there will be no such application. A couple other things get cleared up as well: First, Motorola destroyed Four-Phase Systems leaving Intel to dominate the microprocessor market and Altera is older than Xilinx. On the more serious side, Nick does a great job breaking down the current market into different segments, Microprocessors, ASICs, FPGA, etc. He then also dissects the market based on design goals: zero cost, zero power, zero delay, and zero volume. These two approaches are then used in turn to analyze where some of the current products fall. But that’s not all, more analysis follows taking into consideration transistor scaling, yield implications, processor complexity and design effort. Eventually, Nick arrives at the prediction that reconfigurable hardware might well be the answer to optimizing future designs for the particular function they are to implement at a particular point in time. How exactly he gets to this conclusion is best understood by reading his presentation. One more thing, the presentation is almost 40 pages long, so you better grab a coffee and a comfortable chair.