



## Thinking Like Xilinx

### DSP, WiMax Announcements Highlight Strategy

Conventional wisdom says that Charles Dickens's novels are so long because he was paid by the word. This is not strictly true, as his novels were published in serial form, and Dickens was paid by the installment. The net result is the same, however, as the volume of reading required to mine the gold from his classic works is legendary. Plot lines that could reasonably be summarized in a few succinct paragraphs drag on through chapter after chapter of flowery, flowing, profitable prose.

It appears sometimes that the PR professionals in FPGA and structured ASIC companies graduated from the Dickens school of composition for compensation. Over the past year, in fact, there have been more than one thousand press releases posted by the companies tracked by FPGA and Structured ASIC Journal. Lucky for you, we are constantly on the job, reading all those releases, analyzing the trends, and providing you with something akin to CliffsNotes, abstracting the mayhem into the more manageable. You do have products to design, after all.

Some of our time is spent sifting through the dregs of dreary diatribes on dead-end partnerships - "SuperFPGA Announces Strategic Partnership with Chapter 11 Software, Inc.," superfluous superlatives - "LUTPower Introduces World's Heaviest FPGA," and maniacal legal maneuvers - "Patentbusters, LLC Files Counter-counter-claim Against Plagiarism Technologies Anti-infringement Suit." Even more effort, however, goes into analyzing real industry and technology trends based on the painstakingly isolated, interesting minority of those releases. In those cases, wearing special spin-sensitive goggles (we are professionals, aren't we?), and employing proprietary supercomputing algorithms, we can sometimes discern changes in the market not visible to the naked eye.

Witness the recent announcements by Xilinx on their DSP product roadmap and their WiMax solutions. Both are compelling announcements of real interest to designers in their respective domains. Beyond the announcements

themselves, however, Xilinx is pointing in a direction that will impact all semiconductor companies competing in the rapidly emerging markets left vacant by the exodus of easy ASIC from the mainstream system designer's toolbox.

About a year ago, Xilinx announced a reorganization, highlighting the creation of two new divisions focused on DSP and embedded systems. With the recent DSP roadmap announcement, we are getting a first glimpse into the progress of one of these divisions. In their "XtremeDSP Solutions Roadmap," Xilinx articulates their strategy for addressing the approximately \$2B DSP market. In the past, such an announcement might have focused on the delivery of a new device with hundreds of embedded multiply-accumulator (MAC) units, or announcing a new (and unachievable) theoretical increase in the number of GMACs available to DSP designers. The old-style release would have compared the newly announced capability to competitive offerings, both in the FPGA space, and in alternative technologies.

This time, however, the announcement was somewhat different, and this difference highlights an emerging trend in the type of marketing required for success in the coming expansion of FPGAs and structured ASICs into new market and application areas. The difference is that Xilinx (and a growing number of other vendors as well) dives deep into the prospective customers' design challenges, and talks about solutions to those challenges in the customers' terms. Right off the bat, the Xilinx announcement says they're delivering "application-optimized solutions for multimedia and video imaging (MVI), defense systems, and digital communications."

Of course, the release then goes on to explain the performance advantages of FPGAs for DSP problems with high computational workloads, and how parallelism allows an FPGA-based DSP to sometimes achieve hundreds of times the performance of conventional DSP processors. It also goes on to show how Xilinx is working with industry partners to deliver design solutions that should ease some of the Xtreme pain faced by traditional DSP designers embarking on an FPGA-based acceleration task. It even shows how there are starter kits available for application-specific design work, including a video starter kit with software, camera, development board, and reference designs. Interestingly, there is also a "we're still friends, and not competitors" Co-Processing Kit for the TI DM642 that combines TI DSP processing with Xilinx FPGA acceleration in the form of a daughter card, software, and reference designs that plug nicely into the TI DM642 EVM.

The most telling component of the announcement, however, is the already rich analysis of the demands of various end-applications. In the MVI space, numerous codecs are itemized with applicable Xilinx technologies listed as solutions, and IP libraries are already being assembled by Xilinx and partners to accelerate and ease the transition of applications developers into the FPGA domain. Nowhere in sight is a LUT count, an Fmax claim, or any other FPGA-ese that might frighten away the unenlightened masses peeking cautiously into the programmable logic window for the first time.

Rolling over to the also-recent WiMax announcement, we see the same forces at play. Xilinx's announcement jumps right into the WiMax market dynamics (with nary a 90nm claim), and moves to Xilinx solutions for WiMax development teams articulated in the customers' native technical tongue. WiMax is an interesting and important potential market for programmable logic because companies burned by massive investments in 3G ASIC development that never came to fruition are reluctant to dive into the ASIC abyss a second time. They are now looking for alternative high-performance technologies that can still satisfy their price, volume, and performance requirements.

WiMax competes with a number of other standards with somewhat overlapping capabilities, and its widespread adoption is far from assured. 3G and so-called "3.5G" technologies bring similar performance and range down from the cellular track, and WiFi standards like 802.11g bring up the short-range/high-bandwidth alternative from the bottom. Like most technologies today, WiMax standards are rapidly changing and evolving with 802.16a, d, and e all on the table. Making the marketing input to development even more complex, estimates of the breadth of WiMax deployment vary dramatically, largely depending on whether WiMax finds its way into handheld devices or ends its proliferation with laptop computers.

Companies competing in the WiMax space are faced with a complex decision matrix given this uncertainty in both standard-of-choice and production volume. If they deploy too early on the wrong standard, they may miss the market. If they arrive at the right standard too late with an extended development process, they could miss in another direction. The ability of programmable logic solutions to change course on the fly and to retarget if specifications change, combined with short design times and low development costs, make a compelling argument for FPGA-based WiMax. Xilinx is looking to capitalize on that opportunity by highlighting their ability to provide things like high-performance FFT/iFFT solutions (hmmm, this sounds like some overlap with the DSP announcement), channel estimation,

timing and frequency correction, and forward error correction. They are also offering a “WiMax FEC Pack” that bundles the IP required to implement 802.16 channel coding into a discounted package designed to be accessible by smaller design houses.

Xilinx is also announcing a WiMax mini-PCI module through a partnership with WaveSat. The system allows WiMax developers to completely bypass most of the prototype construction phase, as working hardware is supplied with a PCI interface, WaveSat processor, peripherals, and a Spartan-3 FPGA. The package also includes subscriber MAC software with source code, drivers, technical documentation, schematics, and Gerber files with BOM. For companies that want a fast path to production with minimal engineering work, the kit provides a giant jump-start.

Besides its intended purpose of sending system designers scurrying for their WiMax project checkbooks, the announcement continues the trend of deeply vertical, solution-oriented selling from the leading FPGA company. With increasing regularity, we’re seeing announcements that go beyond FPGA technology and tools, and even beyond generic IP offerings. The new standard seems to be to dive into the designer’s head, presenting a pre-packaged solution to a known, application-specific problem rather than offering a technology that could be adapted by the designer for his particular use.

Does this new trend mean that the days of the phrase “nearest 90nm competitor” are coming to an end? Will we have no more epic specsmanship skirmishes from silicon vendors alternating claims of supremacy to keep us riveted with excitement when there are no college football rivalries on TV? Will we soon see an end to serialized press-release docu-dramas chronicling the everyday lives of each sub-micron transistor in the latest technology turn? Sadly, we won’t likely see the last of those for some time. Meanwhile, however, we will probably notice an increasing trend toward large technology suppliers like Xilinx acting more like traditional ASSP companies, touting turnkey (almost) solutions focused on specific high-value problems. It may not yet be the best of times, but it’s certainly a good start.

*Kevin Morris, FPGA and Structured ASIC Journal*

*November 1, 2005*