

Using Technology to Manage Cost in an Uncertain Economy

Xilinx uses advanced technology to help you reduce cost and manage resources.



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In today's uncertain economy, device cost is the most important issue in the minds of many people; time-to-market issues appear to be less important now, and programmable logic appears to be expensive in the long run. These misguided ideas do not take into account that companies will have to react quickly when the economy improves again. They also fail to realize that the same technology advances we've made in density and performance have also allowed Xilinx to drive down system costs in many areas. Programmable logic is not only the fastest way to develop new products, it's also the lowest cost alternative in most applications.

Your Time to Market Still Matters

When business is slow, many people think they have the extra time they need to create products using ASIC technology, trying to get the lowest possible production cost. Their rationale is that the long design cycle

of an ASIC won't hurt them because the slow economic conditions allow more time before new products need to be introduced. In fact, these very same slow economic conditions may put pressure on companies to very quickly come up with innovative products when their end markets recover. When business starts to improve, it is the companies that get their new products to market first that will reap the rewards of the upturn.

If you've been designing with ASICs, you won't be able to quickly modify your product to meet new market needs. Only programmable logic gives you the flexibility to quickly develop products that will allow you to realize the maximum profit from an improving economy.

Technology Advances Drive Down Cost

Using advanced technology to develop new products has allowed Xilinx to make

tremendous advances in programmable logic density and performance. Just four years ago, our largest device contained one million system gates – today our largest device contains more than eight million system gates. Advances in device technology and software tools have increased system performance of our FPGAs by 40% in just the last year alone.

Our technology has allowed Xilinx to create the most advanced, feature-rich FPGAs in the world – devices that allow dramatic reductions in system cost through massive integration. Embedded PowerPC™ processors and RocketIO™ multi-gigabit serial transceivers are now included as standard features in our Virtex-II Pro™ FPGAs, with no cost increase compared to the previous generations of Virtex devices. In fact, Virtex-II Pro devices have a smaller die size than any competitive FPGA of similar logic density, even though they include all these advanced features.

Moving to advanced technology has also allowed us to dramatically reduce cost and bring programmable logic within the reach of many more cost-conscious customers than before. For example, a 300,000 system gate device cost more than \$200 in 1998. Today, it's under \$20. This better than ten-fold cost reduction in just four years is the result of advances in device architecture as well as an aggressive move to 300 mm wafer technology.

Within the last four years, our sales into consumer and automotive applications have gone from almost nothing, to as much as 15% of Xilinx revenue. Our Spartan™ FPGAs are rapidly becoming the solution of choice for leading-edge consumer products such as home networks, set-top-boxes, DVD recorders, and plasma TV displays. In addition, our CoolRunner™ - II RealDigital CPLDs (which eliminated the use of power-hungry sense amps that require special processes) now use leading edge CMOS technology to deliver the best CPLD performance and the lowest power at the lowest cost. By leveraging the same technology advances as our FPGAs, we can improve the costs of our CPLDs more rapidly than other suppliers.

Our Virtex-II EasyPath™ solutions save cost not by using different silicon, but by using special testing methods that verify the silicon for a single design image, giving dramatic cost savings with no engineering risk. They offer the advantages of FPGAs in development and initial production with dramatic cost savings in high volume production, but none of the risk and cost of an ASIC conversion effort.

ASICs Are Not Always Cheap

An ASIC will always have a lower unit cost than PLDs for very high volumes over a very long time frame. If you are building a million identical units a year for five years, an ASIC would be the lowest cost device,

overall. The problem is, most systems don't stay the same for that long and most don't have high enough volumes to recoup the up-front engineering investment. Programmable logic devices are easier to get, easier to use, and they are far easier to inventory because you can use one device in many different applications.

Life cycle issues can severely affect your profitability as you phase out one product to introduce a new one. Having low unit cost doesn't save you money if you have excess inventory left over at the end of a product's life. Many ASIC users are faced with obsolete inventory issues, while FPGA



users can use the product inventory on a new product and avoid inventory write-down costs.

You wouldn't build a computer with just one set of programs in it and no ability to load new ones, so why build a system with no provision to change the software and hardware as market needs change? With in-system configurable programmable logic from Xilinx, you can update your system's hardware as easily as you would a software driver. When using our Virtex-II Pro FPGAs with the embedded PowerPC processor, this field upgradability extends into the embedded software domain as well. In fact, you could change the partitioning of hardware and software functions in your system without ever replacing your hardware at all – and you can do it all remotely, over the Internet. This can save

you a lot of money and give your products a critical advantage.

Software Is a Key Factor in Cost Savings

The shorter design cycles and time-to-market advantages of FPGAs also mean that you need less engineering resources. This allows you to make the best use of your staff when poor economic conditions restrict your ability to hire more engineers. Our fast, efficient, and highly productive ISE software tools help you get the job done in less time, and they make each engineer more productive. Our ISE software will also produce designs that run faster than ever before, so you can often save money by using slower speed grade devices. Plus, we partner with the leading EDA software suppliers, development board manufacturers, and intellectual property producers to bring you the best solutions from the best minds in our industry.

Debugging your design is far easier and less expensive than ever before as well. The Xilinx design methodology integrates devices and software with our ChipScope Pro logic and bus analyzer to provide a debugging environment that offers unparalleled, real-time access to your system; it reduces debugging times by as much as 50%.

Conclusion

If you think Xilinx technology is expensive, think again. Our technology uses the most advanced processes along with optimal architectures and unique testing programs to offer you not only the highest performance and the lowest power devices, but also the lowest cost devices. Combined with our industry-leading development software, Xilinx gives you an overall solution that not only saves you money up front in design, and in later in production, but it also helps to make your products last longer and make more profit. There is no better or less expensive way to develop your next product. ❏