

THE EDITOR'S VIEW

Who Drives the PC Industry?

Chip Makers are Key Players in Advancing the Platform

By Michael Slater

The PC industry is a remarkable phenomenon. Thanks to a high degree of standardization, accessible sales channels, and countless suppliers, it has become an extremely cost-effective production and marketing machine, resulting in a wide variety of computers at incredibly low prices. The mainstream PC market has become a true commodity business.

While this efficient commodity marketplace serves consumers very well in providing low-cost systems, it has its drawbacks. Chief among them is the difficulty of doing anything innovative. With profit margins shaved paper-thin, PC makers have limited R&D budgets. Furthermore, the high-volume demand for standard products makes it difficult to justify deviating from the tried and true. Anything innovative risks being oddball, and in today's competitive environment, few PC makers are willing to take unnecessary risks.

As a result of these constraints, there is a boring sameness among PCs. There are minor variations in speed, packaging, displays, and storage devices, but real differentiation is rare.

The burden of evolving the PC system architecture falls, it seems, to the chip makers. Intel probably has the best profit margins of any hardware company in the PC business, and Intel has been putting some of the resulting cash into helping the industry evolve. On the hardware front, Intel's most notable effort is the PCI bus. Intel invested a great deal of effort in defining PCI and soliciting system vendor feedback and support. This effort isn't just to create backing for its own products; much to Intel's credit, the PCI standard is fully open. Even competitive processor vendors such as AMD are participating in the PCI special interest group and planning to build chips that support PCI.

Any system vendor, by itself, has little chance of establishing a new bus such as PCI and getting the broad range of support that Intel has garnered. Intel is in the unique position of having both the resources and the influence to move the PC architecture toward a more modern system design.

Intel has invested in a variety of other efforts to push the PC industry along. Intel has been instrumental in making the PCMCIA standard suitable for I/O cards, and the company also has been the driving force behind DOS memory-management standardization efforts and improvements in power management software. Intel CEO Andy Grove has been proselytizing about video and col-

laborative computing, trying to encourage the industry to move forward with more advanced applications. The BAPCo benchmarking effort is another example of Intel's contributions to the PC industry.

Intel benefits from these efforts, of course, because its own success and growth are intimately tied to the success and growth of the PC industry. PCI, for example, will help PCs match workstation I/O performance and chip count, helping to fend off any RISC incursion into the PC market and setting the stage for PCs to take a bite out of the workstation market. Boosting the performance of PCs also fuels the market by enticing more users to upgrade.

Chips and Technologies has also been disappointed with the PC industry's lack of innovation. Frustrated with the absence of systems that exploit the capabilities of its PC/Chip integrated processor, C&T has undertaken the development of reference platforms to get system makers started. Unlike Intel, C&T is hardly flush with cash, but it does have the motivation to create applications for its chips.

C&T showed two reference designs at Comdex. One, called the MiniBook, is a 2.3-lb subnotebook system that C&T claims will run for 40 hours on six AA batteries. C&T has formed a partnership with Lexmark (formerly a division of IBM) to manufacture this system on an OEM basis. The other is a tablet-sized, pen-based system. C&T believes that either product could retail for under \$500, which could create large new markets.

Another example of chip vendors pushing system innovation is DSPs for voice, fax, modem, and multimedia applications. Given the variety of functions these devices can perform and their modest cost, there is a compelling case for including them in all but the lowest-end PCs. System makers are wary of adding any cost that isn't required for the basic system capabilities everyone expects, however.

This hesitance, combined with the immature state of the software standards, is slowing the adoption of DSP technology. The situation here is further complicated by the existence of half a dozen DSP vendors with incompatible solutions. In this instance, the lack of a company among the DSP providers with Intel's dominance may slow the adoption of the technology.

Curiously, the situation with PCs is the opposite of that with workstations and high-end systems. In high-performance markets, it takes a system vendor's profits and attitude to create the most innovative microprocessors; in the PC market, it is the chip vendors that push the system makers along. ♦