<u>**THE EDITOR'S VIEW**</u>

Intel and Microsoft Vie for PC Leadership

As Intel Ventures into System Software, Conflicts Increase

In the nearly 15 years since the creation of the IBM PC, the underlying technology has changed dramatically. But the PC standard has evolved much more slowly, held back, in part, by the overwhelming desire for 100% binary compatibility with all existing PC software. An equally significant constraint has been imposed by the unusual nature of the PC business, which has been brutally efficient in delivering products but terribly inefficient in advancing the standard.

Back in the old days, computer companies conducted research, designed hardware and software, and built complete solutions. Today, most PC makers develop little, if any, technology. Their value added is not in technology but in assembling an effective mix of components at a competitive price, providing a channel for delivering the product to customers, and supporting customers after the sale.

The PC business model is much more effective than the old computer-company model in delivering a broad range of low-cost products, but it has been plagued by a lack of leadership. With the collapse of IBM's influence and the fragmentation of the PC business, no PC vendor has the clout to push the platform forward.

The technology leadership and platform definition for the PC industry now come primarily from Intel and Microsoft, with significant contributions from makers of peripheral chips. Both Intel and Microsoft have launched efforts in the past few years to change the stagnant state of PC system architecture, and this has led to some conflicts between the two companies.

As the major supplier of x86 microprocessors, Intel has always had a huge influence on the PC business. In the past few years, the 600-person Intel Architecture Labs (IAL) has made Intel arguably the world's leading PC R&D center. IAL's charter is not to defend Intel's market share but to make the entire market grow—and Intel will naturally be the biggest beneficiary.

IAL's most far-reaching fruit so far is PCI; Universal Serial Bus (USB), codeveloped with Microsoft and others, and native signal processing (NSP), created largely without Microsoft's involvement, will come on strong next year. Intel has great power to push IAL's technologies into the marketplace not only because of its relationships with PC vendors but also because of its role as a supplier of chip sets and motherboards.

In the past, Microsoft and Intel have, for the most part, maintained a unified front—at least in public. Plug and Play is one area where the two companies have suc-

cessfully collaborated to improve the PC's ease of use. With the NSP initiative, however, the tensions between the companies have broken out into public view.

The fundamental source of the conflict between the two companies is Intel's decision that it cannot afford to depend on Microsoft to advance the PC's capabilities—especially in multimedia and communications. Instead of waiting for Microsoft to provide the support that Intel believes is needed, Intel has decided to develop its own. In some cases, such as with the telephony API (TAPI), Intel did the initial development and then turned it over to Microsoft for integration into Windows.

The support for real-time tasks is the source of one major split. Intel decided to create a real-time environment by adding IA-Spox to Windows, creating an unusual dual-OS setup that diminishes Microsoft's control over the PC software environment. In time, Microsoft will surely provide real-time capabilities within Windows, but Intel apparently isn't willing to wait.

Intel's creation of software that adds APIs to Windows is at the heart of Microsoft's dissatisfaction. Microsoft sees API creation as its domain and believes there are technical conflicts between Microsoft's plans and some aspects of NSP. Microsoft is committed to long-term support of Windows APIs, so it is very cautious about making additions; Intel appears to be trying to go directly to the marketplace, adding functions around Windows without Microsoft's blessing.

Intel and Microsoft have different agendas, and some tension is inevitable. Intel wants to support all operating systems as long as its processors are used, while Microsoft wants to support all microprocessors as long as Windows is the OS. Microsoft is even more concerned with the installed base than with new systems, whereas Intel is focused entirely on next-generation PCs.

Despite the inevitable tension, an open battle between the two companies would be destructive for the industry. PC makers and software developers have a hard enough time deciding what to do without having to cope with conflicting messages from Intel and Microsoft, which could derail the progress that both companies want. Their challenge now is to overcome the distrust that seems to have developed between them, minimize the power struggle, and work together to lead the PC in-

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