

# Realizing the Potential of the Internet

## *Can the Web Retain Its Role as a Platform-Independent Environment?*



In the past two years, it has become evident that the Internet is not only the most important force in the computer industry but also a potent force in the world at large. The depth and breadth of the changes the Internet is producing in computers, publishing, and countless other industries has made the waning years of the millennium an exceptionally exciting period in the history of technology.

As the personal-computer industry has become relatively stable, with entrenched players, low margins, and few opportunities for startups, the focus of investment and innovation has shifted to the Internet. This shift was striking at Esther Dyson's recent 20th PC Forum, which has redefined PC as "platforms for communication." The conference, which serves as a meeting ground for investors and startups seeking funding, has shifted its focus almost entirely to the Internet—as have the startups looking for capital.

There is a widespread conviction that the Internet represents a vast, uncharted terrain with many opportunities for building new companies, yet there is little consensus about just how money will be made. The only clear winners so far are the companies providing the infrastructure equipment, such as Cisco, and individuals who have been able to cash out through initial public offerings of profitless but promising companies with lavish valuations.

The Internet will have a profound impact on the computer business—and, to a lesser degree, on the microprocessor industry—in part because it introduces a radical change in where the power lies and how standards are established. In contrast to the conventional PC world, where Intel and Microsoft wield nearly dictatorial power, the Internet is driven by truly open standards. The competitive battle between Microsoft and Netscape creates tremendous innovation, as each tries to out-implement the other. Each company seeks to add its proprietary value, but the industry has shown little acceptance for features that aren't universal.

Unfortunately, creating rich Web sites requires an assortment of tools beyond what either Microsoft or Netscape offer, and the tools are in a state of rapid evolution. This situation has become excruciatingly clear to us as we have worked on developing an expanded Web presence for *Microprocessor Report*. The authoring tools, user registration systems, discussion-group software, and analysis tools are all immature. Although the potential of the Web is awesome, so too is the gap between where we are today and the mature information infrastructure that can realize this potential.

There are many startups in each technology area, and numerous products are competing for a limited market. Inevitably, many of the products and companies will fail; choosing the winning ones is critical not only for investors but also for anyone creating a sophisticated site.

The lack of prevailing standards in many areas is limiting the Web's effectiveness. There are more than half a dozen alternatives for implementing threaded discussions, for example, each with its own idiosyncrasies. None has reached the critical mass that would make it a clear long-term winner. Each has a different user interface, making it hard for users to participate in discussions at several different sites.

The underlying technologies and mechanisms of the Web are changing as well. All the major standards, from HTTP to HTML, are evolving in significant ways, with new versions due soon. "Push" technologies, which allow content to be delivered to users without making individual browser requests, add another valuable set of options for publishers—as well as another set of competing tools to choose from. Push delivery hides the latency and limited bandwidth of the network, giving users much more responsive access to information. But even as this approach improves the responsiveness to "pushed" data, it adds greatly to the overall bandwidth demand. As full-time, high-speed Internet connections become widespread, the mechanisms and metaphors will change again, and the tools will follow.

The shift from the PC to the Internet as the central computing platform could ultimately enable more microprocessor architectures to have a role and reduce the dominance of the Intel/Microsoft duopoly. Whether the Web retains its independence is in question, however.

The degree to which Wintel dominance is reduced will depend, in part, on whether Microsoft is successful in making the Windows environment compellingly better than other environments for Internet applications. In the near term, the pre-eminence of Unix as a Web server platform is giving new life to Sun and Silicon Graphics. But the vast majority of Web clients are Windows systems, and with Microsoft's purchase of WebTV, Windows (in the CE form) and Internet Explorer will become common even for TV-based browsers. It could become all too tempting for Web developers to write off the non-Windows world, simplifying their lives by sticking with Windows-based tools. It would be a shame if this prime opportunity to develop a new, platform-independent computing infrastructure were lost. □

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