



What's the Future of Desktop Software -- and How Will It Affect Your Privacy?

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Twenty years ago, the personal computer began to revolutionize the way we work and play. In recent years, though, the Internet has been the primary source of technological innovation, offering us everything from online auctions to networked research libraries. As web-based applications encroach on the desktop's turf and a myriad of smart "devices" perform increasingly computer-like functions, will traditional desktop software begin to fade away? And, what are the implications of moving from a private desktop to Internet-based computing, especially when it comes to sharing personal and financial data and protecting individual privacy?



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Those questions were posed during two panels -- one on the future of the desktop, the other exploring the issues surrounding an individual's online persona -- at the recent Supernova 2006 conference, co-hosted by Wharton in San Francisco. None of the panelists offered easy answers, weighing not only the technology challenges but also social and legal issues as they theorized about what the next decade might bring.

Consider the sometimes bewildering variety of increasingly powerful devices used by a typical individual today, both at work and at home: not only desktop and laptop computers, but BlackBerrys, smart cell phones, game boxes, personal music players, digital cameras and so forth. Each of these devices has specialized software -- essentially an operating system -- of its own, noted Lili Cheng, head of the Windows user experience group at Microsoft. "Today, we may think of Microsoft when we think of [personal computer] operating systems, but there are many kinds of operating systems -- on your cell phone, on an Xbox," she said. "The question for the future is how we merge these, how all this specialized software comes together... to support a user experience that includes sharing, synchronizing information, making the experience expand and come alive."

A 'Magic' Blend

The current "chasm" between the web experience and the desktop experience is central, added Kevin Lynch, chief software architect for Adobe Systems. He predicts an eventual blend of the two that will be "magic." One challenge in achieving such magic, according to Lynch, is making web-based applications act like "first class citizens" on the user's computer by freeing them from the constraints of the browser -- such as the difficulty of moving data between applications or websites, for example. Applications built on the web will continue to be hosted on the desktop, he said. "But, we want to be able to go anywhere and use anything -- to take information from any site, and run it on any local machine. So, we need to build web-powered applications in a consistent way." (For more on Adobe's plans for a new generation of software, see Knowledge@Wharton's [interview with Kevin Lynch](#) in this special report.)

Another challenge is connecting all of the devices used by a single person, giving that individual access to, and control of, his or her information wherever it resides. "We all want control -- and we want to take advantage of applications on the web. How can we do both?" asked Tom Ngo, chief technologist for NextPage, which develops enterprise software to manage and control documents. "We have to find a way

to cope with information scattered in a number of places." Ngo predicts hybrid systems combining the best of centralization and decentralization.

Those two approaches to computing represent an old and ongoing battle within the industry. Early computer users worked largely in a highly centralized environment, using terminals linked to a central mainframe computer. The personal computer changed all that by bringing computing power to the user's desktop, and decentralization was in vogue. With the rise of the web, the pendulum swung partially back again, with the web browser behaving much like a terminal displaying content stored on remote servers.

Privacy 'Drives Fragmentation'

On the web, however, the remote system may not be a central server owned by the user's company, but a global assortment of systems owned by dozens of different companies. This shift of control moves the debate away from technology issues to social and legal issues that are, according to some panelists, even more difficult to solve.

"Privacy is a huge driver for fragmentation," said Ngo, who described his own past experience working as a consultant with different employers. "My world was fragmented because that's the only way I know to definitely keep those interactions separate and private." As a result of such privacy concerns, he said, "We'll always want a rich environment that we control. In other words, we'll always want a desktop."

What does control of one's data really mean? In the context of web-based computing, there are three types of individual information that are central to an understanding of privacy issues: explicit data such as personal profiles and financial information; implicit data gathered as individuals interact with sites on the web; and information about one's reputation or influence such as how one's opinions on anything from digital cameras to political issues are viewed and reported by others online.

"Shocking" is how John McCrea, vice president of marketing for Plaxo, describes the willingness of many consumers to give out personal and financial information online. His company provides "smart" address book services to 10 million people who want a virtual list of contacts that can be automatically updated and available anywhere. "As custodians of that personal information, we need a high bar on privacy," said McCrea. "The user owns the information; we simply store it and enable users to share it. But we find that most people don't read a website's privacy policy...and they will give a lot of information, like cell phone numbers and their birth date, without a good reason."

Then there are those who *do* have a good reason for sharing their personal and financial data; in doing so, they become valuable to online services. "People who want cash fast and have bad credit will give you a lot of information," said Seth Goldstein, founder of Root Markets, an online tool to allow buyers and sellers of mortgages to exchange consumer data. That information, in turn, creates great value. For example, a California refinancing candidate with fair to good credit is worth about \$150, and that person's customer data may be sold four times to four qualified lenders, he explained.

Root Markets and other online vendors concerned about ownership of this explicit data and implicit data (such as a user's online "clickstream") have formed Attention Trust, a nonprofit that advocates for consumer ownership of such information. "We think consumers should have the right to a copy of their "attention" data -- that is, data that reflects your interests, your activities, and your values," said Goldstein, "as well as have the ability to see how it's being used by others." This opens a window into the "black box" of data often maintained between buyers and sellers on the web.

"Do people care? Are consumers apathetic? Will they force companies to compete on the basis of privacy protections -- or will there be a race to the bottom?" Those are the key questions, said Goldstein.

Intel's chief strategist, Chris Thomas, framed the issue another way, seeing an opportunity as well as a threat: "As we create new services, we have new opportunities to create clear boundaries. If we can't replicate what a century of laws have protected, then we're doing something wrong."

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