

I have obtained the source to several article by Sun people that have appeared in the trade press. I will include a few of the more interesting ones over the next few months. -johnj

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Computing 2000: Designed Environments and Nomadic Devices

By Bill Joy  
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Bill Joy is a co-founder and vice president of research and development at Sun Microsystems, Inc., Mountain View, Calif. He is considered one of the world's leading experts on UNIX, and was responsible for BSD UNIX, one of the two major versions of the operating system. Among other projects, he designed Sun's NFS protocol and was co-designer of the SPARC RISC microprocessor architecture.

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In the last 10 years, a powerful computing model has emerged: a desktop machine with a bit-map display, mouse and keyboard. The software for this computer uses overlapping windows to display information. You point and click with the mouse and make selections from menus to operate the machine.

This vision of personal computing originated in the Alto personal computer at Xerox PARC in the 1970s. In the last two decades, the technology has become accessible to all, in machines such as UNIX workstations, Macintosh personal computers, and more recently, in IBM PC-compatibles with the release of Windows 3.0.

But the one constant in technology is change. And this common style of computing is destined to change drastically by the year 2000. Driven by the emergence of powerful and inexpensive RISC hardware technology and a range of new display technologies, computers will be able to interact with users in ways that are more like humans and less like machines.

By the year 2000, the typical computer user will be more likely to interact with the system using voice or touch than by typing or pointing and clicking with a mouse. By recognizing voice, handwriting and gestures, computers will become more compatible with our work and



home environments, and also more invisible than they are today.

An example of a new kind of device is a business environment version of the Star Trek "tricorder." This device will combine several functions that are separate today: filofax, tape recorder, telephone, fax machine and digital library terminal. Users will carry it into a conference room or use it to copy down what is projected onto the screen by someone else. They will be able to record interactions with others and work collaboratively using the other computing devices that are part of the conference or work room, as well as the other tricorders in the room.

This simple example points out two major trends: the design of environments in which work occurs (the electronic conference room) and the increasing "nomadic-ness" of computing devices.

In the 21st century, it will no longer be sufficient to put computers in environments: they must be part of the environments. I believe that the style of user-centered design promoted by Christopher Alexander (author of A Pattern Language, A New Theory of Urban Design) for designing homes and cities can be applied to the design of these new work environments. Designers will sit with users and design work environments where computer and communications devices are built into the rooms, in the same way that architects work with horizontal and vertical space, windows, doors, and exposures today.

Any device that can be nomadic will be nomadic in the 21st century. If you can take it with you, it will be much more useful! This idea is explored in depth in Jacques Attali's excellent new book, Lignes d'Horizon, and is visible today in portable computers and cellular phones. The social and technological trends that he describes will accelerate this process.

The 1990s will be an exciting time for computing. In the next century, I look forward to computers that are designed on a significantly more human scale, well-designed work environments and nomadic devices.

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