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SPECIAL REPORT: A CEO'S GUIDE TO TECHNOLOGY

Sneak Peeks at Tomorrow's Office

From wraparound computer screens to "electronic assistants" that summarize data, here's what you have to look forward to

Visitors to Greg Welch's office might pause in the doorway and stare -- and rightly so. Welch, a researcher in human-machine interaction at the University of North Carolina at Chapel Hill, sits in front of a computer display that's 4,000 pixels wide -- more than three times the width of a 17-inch monitor. The display wraps around Welch, allowing him to see many documents at once.

The huge, hypnotizing screen is among several ideas Welch has for the ever-evolving office of the future. For another, ask to look at some of his numbers or a chart -- and he'll project them on a wall or floor, a precursor to showing them in 3-D for virtual meetings. Both technologies may seem far away, but Welch says they could hit the market in as little as five years.

PRODUCTIVITY BOOSTERS. Welch is just one of many scientists at universities and government labs -- and at companies such as IBM ([IBM](#)), Microsoft ([MSFT](#)), and even office-furniture maker Steelcase ([SCS](#)) -- whose work is changing the office environment. They're developing desk chairs that will sense when you're stressed and, perhaps, tell your boss to offload some of your work; PCs that can figure out during your senior moments where you've seen a particular name; and desktops that, with a push of a button, transform themselves into computer monitors to help facilitate discussion during a roundtable meeting.

All of these ideas have one goal in common: To raise white-collar productivity -- or at least preserve the huge gains of recent years while avoiding employee burnout.

The idea is to build upon the innovations that have transformed offices over the past 15 years. As recently as 1990, voice mail was still being introduced in Corporate America, e-mail was largely self-contained within companies, and attending a meeting in another city meant going there.

WALLS? WHAT WALLS? Since then, Net-based forms of communication -- such as e-mail, instant messaging, and videoconferencing, abetted by lighter and more versatile cell phones and laptop computers -- have sped up both work and business decisions. The tools have improved so rapidly that "customers are starting to feel that office technology has come about as far as it can," says Tom Gruver, group product manager at Microsoft. "There are no more expectations of productivity increases."

Experts, however, swear that office innovation is about to take another leap. One reason they cite is technology advances, such as the ability to make larger computer screens, which could make Welch's wraparound displays affordable. More powerful than that, however, is the need for technologies to help keep an aging workforce spry, that can compensate for the growing complexity of many jobs, and that meet the needs of increasingly mobile employees. Taken together, such technologies will ultimately

change the definition of the modern office.

In fact, the idea that an office is an enclosure with walls is already disappearing, thanks to technologies such as Wi-Fi, which provides high-speed access to a network or the Internet from any place a connected employee chooses to wander, be it down the hall or to a café, airport, or hotel.

UNOBTRUSIVE TECH. New Yorkers can already answer their e-mail while they're out and about -- say, sitting in Bryant Park, next to the city's main public library. In fact, public places may soon be equipped as extensions of the office: Steelcase considers cafés a rich potential market for its office products. Think of computer displays built into restaurant tables, says Mark Greiner, senior vice-president for workplace futures at Steelcase, which already makes plasma displays used for group meetings and presentations. "We're moving into an era when we'll have more technology, but it won't be as apparent," Greiner adds.

Other companies are also planning to adapt their products to the mobile workstyle. Microsoft is working on software to enable an e-mail or voice-mail message to arrive at whatever computer or phone you're closest to. Drop your cell phone on your desk when you arrive at work, and special chips in it will route cell calls to your office number, Gruver says.

As work becomes more decentralized, office buildings may change, too. Partly, that will happen as Generation Y -- often defined as people born between 1981 and 1999 -- finds itself doing more and more collaboration to solve difficult problems. Thus, many companies are starting to enlarge and redesign common areas in office buildings so they're more spacious and homey, says Fred Dust, a designer at Ideo in San Francisco. He says his redesigns can help cut weeks from some group project schedules by making the work more pleasant.

CAMEO CAMERA. Better software can also make collaboration more effective. Surveys show that employees think half the time they spend in meetings is wasted. So a number of companies, including Microsoft, have developed digital white boards, built into desks, that allow everyone in a meeting to jot down ideas and exchange them.

Videoconferencing should improve dramatically as well. Microsoft's office of the future showcase at its Redmond (Wash.) headquarters is designed to offer customers a glimpse into its R&D. Microsoft uses cameras to project a 360-degree view of everyone at the table for employees who join a meeting remotely. In an inset screen at the bottom of the first display, they might also show the face of each person who speaks. The idea is to avoid misunderstandings that are common to phone conferencing, where it sometimes isn't clear who's speaking or whether the person is serious or joking.

Smart software might boost efficiency in other ways -- for instance, by taking over routine tasks and leaving more time for creative thinking. Sandia National Laboratories is developing a program that lets a PC or other computing device soak in the knowledge within your files -- so you can retrieve information based on the data you'd like to find rather than a file name, says Chris Forsythe, a member of Sandia's technical staff.

CRASH PROGRAM. A more advanced version of this software would realize that you've gotten distracted during a conference call (sensors in your office might notice that you've been swinging around in your chair), and then give you a typed summary of the most important points the callers discussed. Essentially, it would act as a personal assistant, says Forsythe, who uses the software already and believes it will be commercialized within two years.

Meanwhile, researchers at Palo Alto Research Center (PARC), famed for inventing laser printing and Ethernet, are developing so-called summarizing programs, which should help, say, an office worker who's asked to develop a presentation on a 400-page report overnight, says Mark Stefik, research fellow and manager of PARC's Information Sciences & Technologies Laboratory. The program can sum up the main points and present them in grammatically correct sentences -- and in just a few pages.

Finally, researchers are applying new technologies to eliminate office annoyances, such as having to remember those pesky passwords. Microsoft has developed a technology it calls "Click It." Instead of having to enter a 10-digit number or get their retina scanned to start up their PCs, employees would log in by using the mouse to click on 10 places within, say, a picture of their son playing soccer. Research shows that pictures are easier to remember than numbers -- and since each picture contains millions of pixels, picture passwords can be highly secure, says Gruver.

IN AND OUT LIGHTS. An easier, though less secure, way to accomplish that is for employees to wear badges with embedded RFID (radio-frequency identification), says Steelcase's Greiner. As you approach your office, a scanner might read the tag and alert your computer, which would then boot up and open to the page you last looked at the night before.

Steelcase has also been playing around with office lights that change hue or feature a stripe of a certain color depending on whether you're in or out -- so co-workers can see from a distance instead of walking over or calling your extension, Greiner says.

Of course, many of these technologies will have to get cheaper before they can be commercialized. And because office furniture typically has a 10-year lifespan, replacement will be gradual. And yet, if the past 15 years have proven anything, it's that the office of the future will arrive -- maybe before you know it.

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