HermanMiller

Cross Performance at Work

What New Roles Mean to Chairs We Sit In

© Boyer Nelles Studios, Ltd.
© 1994 Herman Miller, Inc.

Companies today are faced with adjusting their office environments to the activities and demographics of a changing work force. The people responsible for making these adjustments may soon be speaking in terms of "cross performance."

"Cross performance" is a simple way of referring to the complex flow of movements and duties that a person goes through in the course of a workday. It conjures up images of employees undertaking a variety of tasks as they work, either in their chairs or away from them. In picturing cross performance, one might see someone leaning forward to read a computer screen, sitting upright or leaning back to use the keyboard, relaxing to take a phone call, moving to the side to retrieve a file, getting up to attend a meeting, or going out to develop business. The imagined person doing these multiple functions might be a petite woman from Thailand or a large man from Tulsa; a market researcher, a customer service representative, or a corporate executive. No single image can encompass the multiplicity of tasks nor the diversity of people doing them.

"Cross performance" denotes all these images. It captures the continual interplay of people and systems at work. In examining this interplay in the office environment of the 1990s, one sees that cross performance is in the corporate air as well as in the office chair.

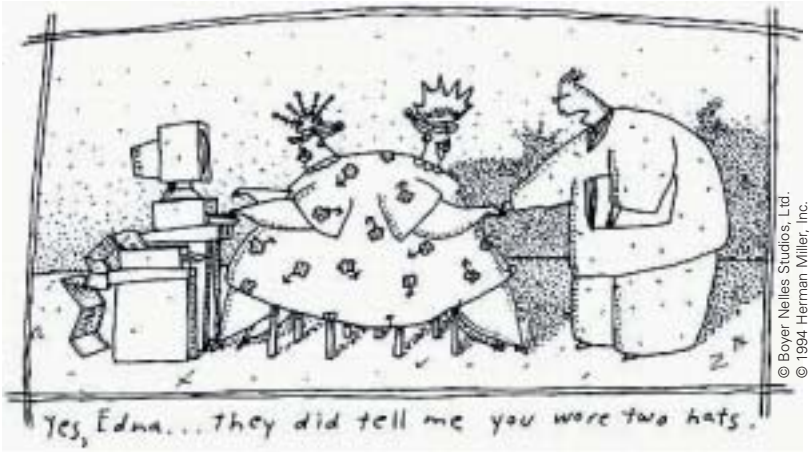
Cross performance in the air.

It's no secret that the 1990s have imposed different work requirements on the people who still have jobs. Downsizing, reengineering, flattened hierarchies, empowerment, quality initiatives, the realization that all employees serve internal as well as external customers: Each of these contemporary changes has increased the responsibilities placed on individual employees.

As everyone recognizes, these changes have been brought about by the need to compete in a global economy, coupled with the tools corporations now have for competing. The new mother of all tools is the computer, and workers are still discovering what it can give birth to. Companies are still in the midst of the Technological Revolution.

In the next century, doctoral dissertations may well compare the late 1800s with the late 1900s to determine whether the Industrial Revolution or the Technological Revolution made the greatest impact on the world as it was known. Just as the Industrial Revolution took

© 2001 Herman Miller Inc ™ HermanMiller, HermanMiller, and are among the trademarks of Herman Miller Inc.



© Boyer Nelles Studios, Ltd.
© 1994 Herman Miller, Inc.

the wool spinner out of the cottage and into the mill, the Technological Revolution is changing forever the way we process work and create products. And just as the earlier revolution gave rise to the middle class, the Technological Revolution is democratizing the workplace. It is blurring or leveling many of the status distinctions that formerly stratified the office, turning things that used to signify status into symbols of the past.

The difference between typewriters and computers is an obvious example. Clerks and secretaries used typewriters; no one above a certain level of the office hierarchy would be seen with a typewriter on the desk. Today, everyone—including the CEO—has a computer. Everyone is tethered to technology, and everyone is cross performing.

The human factor.

To support cross performance fully, people making decisions about the work environment must understand a great deal more than where to move walls and place electronic cables. They must consider the changing size—both numerically and physically—of people in the work force; their tasks and work space; their safety and health; and their comfort.

Dealing with these considerations involves an appreciation and application of ergonomics. Developed as an interdisciplinary profession in England in the 1950s, ergonomics originally entailed "the scientific study of the efficiency of people in their working environment."[1] At roughly the same time in the United States, human-factors engineering evolved from the study of cockpit controls designed for military aircraft. Used interchangeably, both terms refer to a fundamental concern with human performance.

Ergonomist Rani Lueder describes ergonomics as "adapting products and processes to human characteristics and capabilities to improve people's well-being and to optimize productivity."[2] Ergonomist Christine Grant simply calls it "the science of fitting work and the work environment to people so they don't get hurt and tired."[3]

In designing products and developing codes and standards, ergonomists employ anthropometrics (the size, shape, and weight of people); biomechanics (the physical dynamics and limitations of people); situational analysis (the social and physical task environment); and preventive medicine.

Employee diversity.

Needing both technological and interpersonal skills, today's employees are expected to move naturally from computer-intensive activities to people-intensive interactions. But while the number of employees may have been reduced, the forces of attrition require continual replenishment of the work force. And skilled or trainable cross performers are coming from a contracting pool of applicants, one that contains more women, more Asians and Hispanics, more people at middle and older ages, and more people with disabilities.[4]

Given a work force that has more physical dissimilarities and a greater range of body types than ever before, progressive companies no longer expect their employees to fit the work environment. As they have learned from complying with the Americans with Disabilities Act (ADA), there are overall benefits to be gained from making the environment fit the employee. Adjustable furniture helps someone in a wheelchair as well as someone who is short; a drawer that's easy to open helps someone with arthritis as well as someone whose arms are full. Although the ADA does not specify standards, equipment, or furniture, those who have embraced the Act are supporting cross performance.

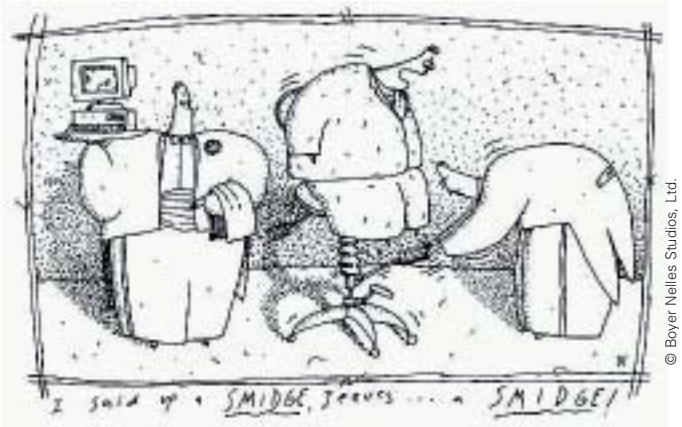
Tasks and work space.

In most of today's offices, it would be hard to find a single person in a single posture doing a single task. Versatile workers require versatile systems to support them. The need for adjustable work surfaces, cabinets, and chairs to accommodate different tasks is compounded by the trend toward shared space that accommodates different workers using the same systems. In addition, open access to management and other signs of democracy are freeing more people to focus on performance, rather than status or decor, when making their purchasing decisions.[5]

Health and safety.

Work-place codes and regulations governing the health and safety of employees proliferate, yet workers' compensation costs continue to cause concern. While the rapid spread of VDTs (video display terminals) has led to a raft of regulations and guidelines, CTDs (cumulative trauma disorders) and back problems now jockey for first place in workers' compensation claims in the U.S.[6]

© Boyer Nelles Studios, Ltd.
© 1994 Herman Miller, Inc.



© Boyer Nelles Studios, Ltd.
© 1994 Herman Miller, Inc.

Statisticians know that one cannot equate correlation with causality, i.e., a cause-and-effect relationship between the rise of VDTs and CTDs has yet to be proved. Nonetheless, state legislators since 1980 have attempted to enact over 300 pieces of legislation governing the workstation. None has so far succeeded. San Francisco's highly publicized and restrictive VDT legislation, governing equipment, furniture, training, and break times, was enacted in January 1991. While today it applies to that city's employees, it has been struck down by the courts for application in the private sector. At the end of 1994, OSHA issued a "Notice of Proposed Rule-Making" that requires employers to identify and minimize job features that may pose a CTD risk to employees.[7]

Comfort.

The American National Standards Institute (ANSI) issues voluntary guidelines for workplace design based on human-factors engineering. Scheduled revisions of ANSI/HFES 100-1988, the standard for the video display terminal workstation, are still underway. All point to the fact that ergonomic research is far from complete on the benefit of specific design factors. Still, if people are comfortable and their chairs support a variety of tasks, they're probably less likely to be injured. The general direction of the standards is toward supporting cross performance through furniture that is multi-adjustable, suitable to individual employees, and easy to use.[8]

Cross performance in the chair.

Calling the office chair "the most important tool after electronic equipment," Environmental and Safety Specialist Suzanne Gallo oversees a chair workshop for 3,000 employees at Hewlett-Packard Company. "We take the politics out of seating. There's no separation between management and task chairs. People come here to get trained and fitted for the chair that meets their needs. The sole criterion is comfort. If a chair meets ANSI standards but doesn't fit the person, what good is it?"[9]

That is a very good question. With proper training, a high percentage of users will make some chair adjustments.[10] However, even if they were to make consistent use of all the adjustments, people with body sizes at the extreme ends of the anthropometric scale face the "fit" problem.[11] That petite woman from Thailand and the large man from Tulsa mentioned earlier are not likely to find comfort in the same chair.

If the shoe fits, . . .

The two dimensions that appear most critical to chair fit are seat height and seat depth; addressing those elements is the starting point. Another common-sense solution is to design one chair in small, medium, and large sizes to accommodate the broadest possible range of the anthropometric scale—without the user needing to make gross adjustments.

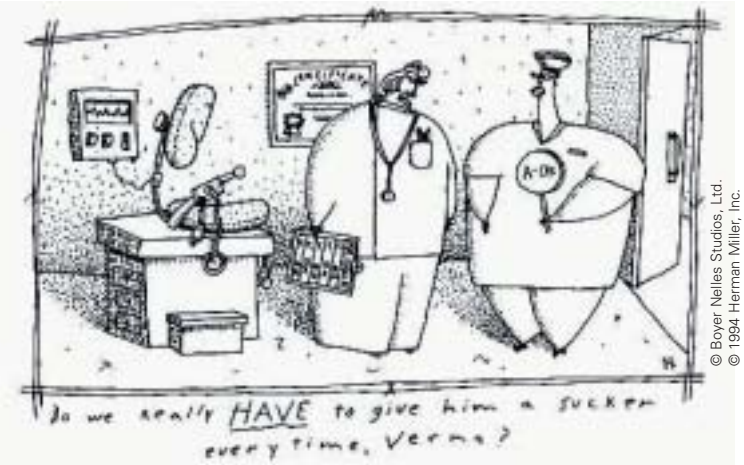
"People should 'wear their chairs' like they wear their shoes," says Bill Stumpf, design partner of Don Chadwick for Herman Miller. "You don't adjust your shoe every time you put it on. You choose the right size to start with." Adds Chadwick, "Like a shoe that fits, a chair that fits the body has nothing to do with status. Everyone deserves equal comfort."[12]

Go with the flow.

Assuming that employees have adjustable chairs of the right size, they then must be able to make effortless changes in posture during cross performance. They should not have to stop what they're doing and adjust their chairs every time they change to another task. For reasons of efficiency and practicality, the chair should be designed to allow spontaneous postural movements that support the flow of performance.

Ergonomists are still debating the Mandal and Grandjean theories of optimal posture at work. Mandal advocates a forward-sloping seat that keeps the back upright and tilts the thighs forward. Grandjean proponents say the position puts too much pressure on the legs. They favor a neutral to backward tilt, citing studies which show that VDT workers in particular spend a large part of the day reclining to do their work.[13]

Rather than continue such polarization, it would seem more helpful to recall what Charles Eames said about designing chairs for how people sit rather than how they should sit. Time-lapse photography of employees working on computers shows them going through a continuum of postural changes from Mandal to Grandjean.[14] Based on how people sit, there is no one right posture for productive cross performance.



© Boyer Nelles Studios, Ltd.
© 1994 Herman Miller, Inc.

Instead of prescribing posture, a cross performance chair supports many work styles. It anticipates shifting body weight and allows for choices in posture through passive as well as active adjustments. In accommodating the biomechanics of performance, the chair also reinforces the democratic office environment where people have choices and work more independently.

"They're more independent; but at the same time, they're spending a lot of hours tied to the 'reduced universe' of the workstation," Stumpf comments. "They're like older people who have limited their movements to their little nests at home, with everything close at hand. You have to design some physicality into the chair—make it more of a running shoe than an old slipper—to make people feel more alive."

Accent the positive.

Making people feel more vital is one goal of health-positive ergonomics.[15] A health-positive office chair goes beyond creating the sense of comfort. It addresses comfort through design, much as a car addresses safety through anti-lock brake systems. Just as those brake systems stop a person from automatically spinning out of control, a health-positive chair can stop a worker from overloading the spine or tensing muscles to the point where physical and mental stress increase.

A chair that is health-positive by design can also address comfort by keeping body temperature at an even level. Although people tend to equate padded upholstery with comfort, foam and fabric actually make it difficult for fresh air to reach the skin and evaporate moisture. Taking air circulation into account in cushion-shape design or using new, high-tech materials prevents the build-up of body heat. This not only makes the employee sitting for hours at a time feel better, it saves the employer money. It's estimated that ergonomically designed, ventilated office chairs could reduce HVAC investments by up to $100 per chair.[16]

The final image.

With so many variables to consider in the work force and in the systems that support cross performance, what is the person responsible for purchasing workstation furniture to do? The answer may well be, "Depend on the experts." As Bill Stumpf says, "I'd like to think the people we design for trust us to make things better. Remember what Tennessee Williams said about relying on the kindness of strangers? Well, we're the strangers."

Notes

1 Adapted from the Oxford English Dictionary. The summary of ergonomics is excerpted from "Ergonomics: A Brief History," from the studio office of Bill Stumpf, Minneapolis, MN.

2 Lueder, Rani, Humanics Ergosystems, Inc., Encino, CA., telephone interview, July 1994.

3 Grant, Christin, Christin Grant Associates, Ann Arbor, MI., telephone interview, July 1994.

4 These trends have evolved into received wisdom originated by Johnston, William B., and A.E. Packer, Workforce 2000: Work and Workers for the 21st Century (Hudson Institute, Indianapolis, IN, 1987).

5 In the 1970s, the mix of office chairs sold was 66% management, 33% secretarial. In the 1980s, the mix became 50-50, with the secretarial chair renamed the "task chair" in response to computerization and gender equity. The task chair has since become the largest segment of the market. In large companies, the purchase of task chairs increased from 50% in 1991 to 53% in 1994; in small companies during this period, task chair purchases rose from 42% to 57%. ("Office Trends, Spring 1994," p. 53, Kennedy Research, Inc., Grand Rapids, MI.)

6 Judy, Barbara, Job Accommodation Network, Morgantown, VA, telephone interview, October 1993.

7 McIntosh, Dennis, Herman Miller, Inc., Washington, D.C., telephone interview (legislative overview), July 1994.

8 Ibid.

9 Gallo, Suzanne, Hewlett-Packard Company, Cupertino, CA, telephone interview, July 1994.

10 For example, in comparing the use of ten adjustment features on various chairs, researchers found that 96% of trained users will adjust seat height and 80% will adjust tilt tension. ("Echo Benchmark Research," Bill Dowell, Herman Miller, Inc., June 1993.)

11 According to "1988 Anthropometric Survey," Anthropology Research Project, Inc., Yellow Springs, OH, office chairs conforming to ANSI standards did not fit the smallest 35% of women and largest 5% of males on the anthropometric scale.

12 Stumpf, Bill, and Don Chadwick, telephone interviews, July 1994.

13 Documents from Herman Miller.

14 Ibid.

15 A term originated by Dr. Charles Burton, Abbott Northwestern Hospital, Lower Back Clinic, Minneapolis, MN.

16 Houghton, David J., P.E., et al., "The State of the Art: Space Cooling and Air Handling," COMPETITEK (Rocky Mountain Institute, Boulder, CO, August 1992), p. 63.