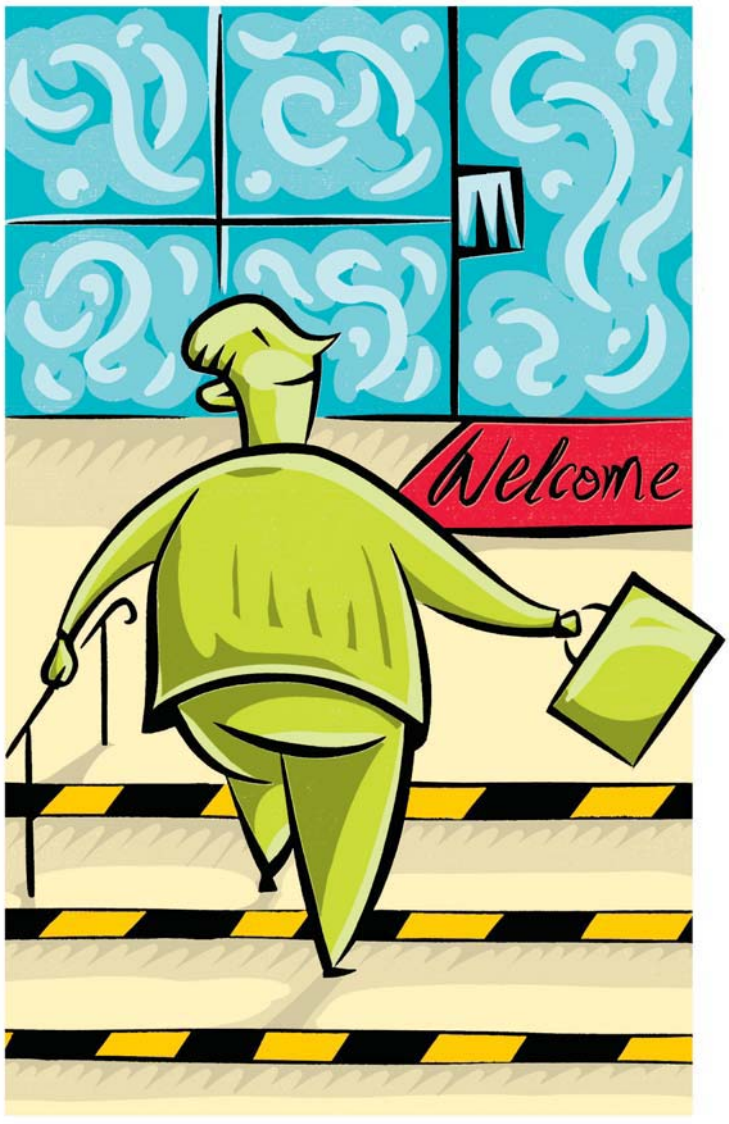
Embracing Boomers

How Workplace Design for Maturing Knowledge Workers Benefits Everyone



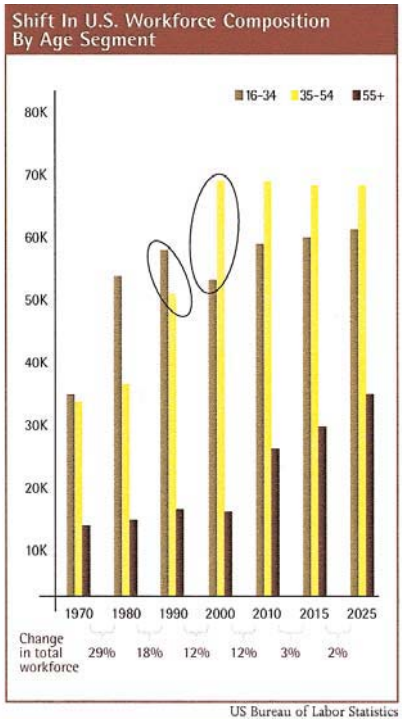
Baby boomers—Americans born between 1946 and 1964—are redefining what it means to age. They're staying healthier, remaining more active, and working longer than any generation before them. As a result, we're beginning the twenty-first century with a work force whose average age is shifting upward.

High fertility after World War II and reduced death rates have increased numbers of people age 65 and older. As education and income levels rise, increasing numbers of individuals are maturing with markedly different life expectancies and personal expectations than their forebears.[1]

In her landmark economic history of retirement in the U.S., Dora Costa suggests that retirement might now be viewed as a "time of personal discovery and fulfillment" rather than one of withdrawal, a situation made possible by rising incomes and the abundance and declining cost of leisure activities.[2]

Redefined expectations among baby boomers have affected their view of work just as companies have begun changing their attitudes toward them. Perhaps more importantly, the corporate world is recognizing the mature adult as more than a consumer, but as a needed worker. A few pioneering companies have programs to attract maturing workers, while professional associations are starting to spread the word to their members.[3]

"The pool of older workers is increasing," says Elizabeth Zelinski, Executive Director of USC Ethel Percy Andrus Gerontology Center. She adds that older workers cost less to retrain than younger workers, who



would be getting initial training. Also, older workers have lower turnover rates and, in many cases, better work performance.[4] Because overall costs are not much different based on the age of employees,[5] it makes sense for organizations to employ older workers. As they do, however, they must go beyond merely offering the maturing worker a job; they must address the work and the workplace to ensure they fit the worker through ergonomics.[6] The challenge for the workplace is to allow maturing workers to achieve their full potential—in the face of declining abilities—through workspaces designed to accommodate them.[7]

The Work Force Shift: Boomers Are Sticking Around

From a global perspective, the trend among the general population is similar to that occurring in the U.S. The ranks of 60-year olds are growing 1.9 percent a year—60 percent faster than the overall world population. Now the global ratio of general population to the 60 and over contingent is 9:1; the UN Population Division predicts it will be only four-to-one by mid-century.[8]

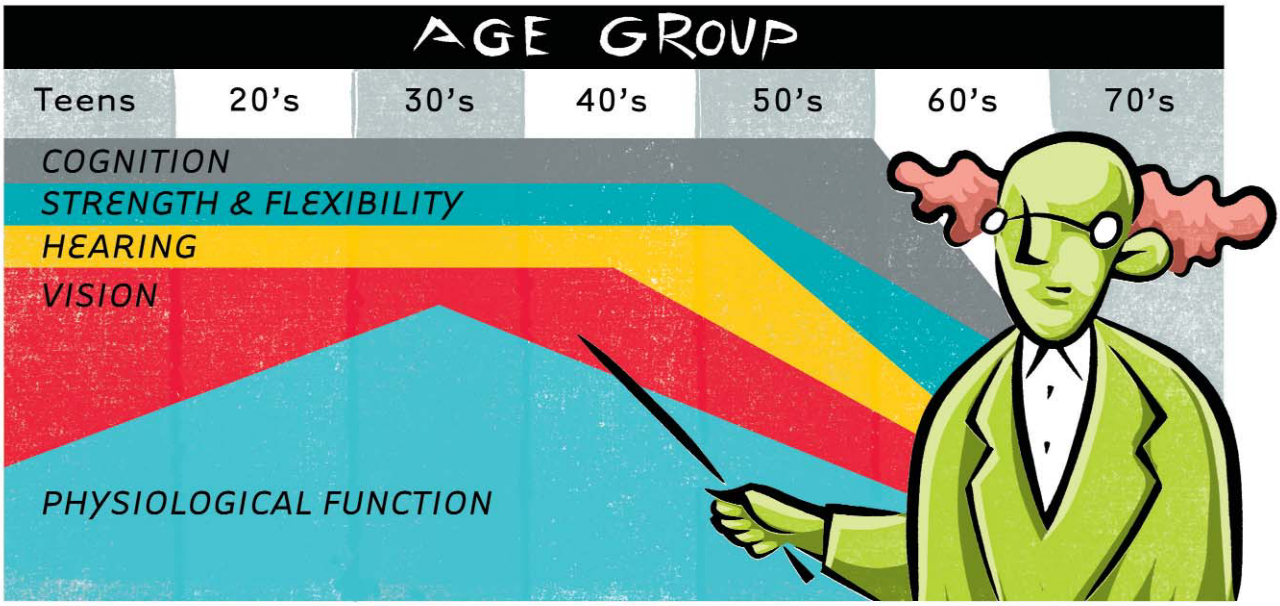
In the U.S., Boomers comprise almost one-third of the population.[9] In 2002, there were 20.2 million persons aged 55 and older in the labor force, or 14.2 percent of the total.[10] The labor force spanning the Baby Boom cohorts (aged 45 to 54 and 55 to 64) will grow by 7.4 million people between 2003 and 2010. And the fastest-growing labor force group, people aged 55 to 64, will increase by over 20 percent by 2010.[11] According to the Bureau of Labor Statistics (BLS), members of the work force aged 55 and up will grow by an annual rate of four percent—four times faster than the growth expected for the entire work force.[12]

The U.S. has one of the highest labor force participation rates for persons aged 65 and older in the developed world. The causes for this include the elimination of mandatory retirement, the liberalization of the Social Security retirement earnings test, and the increase in the normal retirement age under Social Security.

And a primary reason workers are likely to postpone retirement will be the demand for labor. With slowing labor force growth, employers may have little choice but to turn to older workers.[13] A 2002 poll of American workers between the ages of 45 to 74 by the American Association for Retired Persons (AARP) found that less than a third of them plan to stop working when they reach "retirement age."[14]

Even more intriguing, a Gallup poll found that 60 percent of boomers plan to continue working past age 65.[15] The BLS projects the participation rate of maturing Americans —age 55 and older— to rise by about three percentage points over the next 15 to 20 years.[16] While long-term projections can be uncertain, an aging labor force for the short run is certain: in the U.S. workers 55 and older will account for an increasing share of the workforce.[17]

Where might these workers be employed? The percentage of workers 55 and older is expected to increase across most occupational categories, with the largest growth occurring in occupations such as executives and managers; professional occupations; sales; and administrative support.[18] Although part-time work increases with age, full-time employment has



been on the rise among workers 55 and older in recent years. Full-time employment in the 65+ work force increased from 45.4 percent to 50 percent between 1994 and 2001.[19]

Age-Related Changes in Function

Our bodies typically peak in functional performance in our teens and twenties. While age 40 has historically been the embarkment of "middle age", we can begin to see the decline of physiological functions as early as 30. By the end of our third decade in life our bodies have matured.

In a 2004 study, 35 percent of persons aged 65 and older reported some type of activity limitation, as do 20 percent of those 55-64.[20]

In a study of 3,752 people age 55 or older, the following functional impairments occur most frequently: locomotion, bending, remembering, twisting, reaching, hearing, grasping, and seeing.[21]

People can be limited in their ability to work by chronic conditions as they mature, although it's important to remember that their functional performance cannot be judged solely based on age. "It's difficult to pinpoint exact ages when physiological and cognitive changes occur, as the population is very heterogeneous. There are wide individual differences," says Dr. Sara J. Czaja, PhD., Professor and Co-Director of the University of Miami's Center on Aging.[22]

Today's jobs involve more brain than brawn, which should make it possible for more older workers to continue on the job.[23] However, workplace modifications and schedule adjustments will likely be needed. Whether they are made so partially disabled people can continue to work or because workers, for whatever reason, can no longer perform effectively in their current jobs, these accommodations must address the most significant changes that occur with aging.

Vision

Most of us feel the effects of aging on vision in our forties when vision declines in the normal reading range, and our ability to focus and react wanes. Color becomes distorted. Contrasts are less sharp.[24] And sensitivity to glare doubles with aging.[25] In general, middle-aged and older workers need more light.[26] They may require five or six times more light than a 20-year old.[27]

It is a misconception that presbyopia—the ability for the eyes to focus on near objects—occurs only in older people. Decrease in the ability starts in the twenties, and in the early forties the ability is lowered by half that of those in their twenties. When using computer displays in the office, middle-aged office workers have difficulty focusing on the screen more so than younger workers because of presbyopia.

How can we accommodate these changes in vision in the workplace as we continue to age and work?

- We can provide maturing workers with larger visual details.
- We can increase illumination by about 20 percent.[28]

The optimal ambient level is 300 to 500 lux, which is lower than most offices are used to.

- We can provide individual control of lighting to reduce glare and provide adjustable light sources, and cover windows with appropriate treatments to shield maturing eyes from direct light.[29]
- We can provide adjustability for users of computers to influence proper positioning of the screen, input devices, and chair height to accommodate the eyes and promote healthy postures.
- We can suggest that workers be evaluated for eyeglasses when using computers, no matter what the age.[30]
- We can increase the size of visual objects (e.g., font size, icon size), their brightness, and their contrast.[31]
- We could apply auto design concepts for maturing people to all designs, such as placing display colors (yellows, oranges, yellow-greens, and whites) on contrasting backgrounds and enhancing display features (analog, larger fonts) as well as controls (color, size, shape, and readable identification labels).[32]

Hearing

Hearing impairment is a major concern as we age and can occur as early as age 40. Uncorrected hearing impairment can lead to social isolation and cognitive decline.[33] Approximately 10 percent of middle-aged adults (under age 50) suffer hearing losses that hinder social interaction; by age 65 the percentage jumps to more than 50 percent of all men and 30 percent of all women.[34]

The ability to hear higher frequencies declines and background noise often interferes with the ability to hear as we age.[35] Presbycusis—hearing loss due to aging—can include more than a high-frequency hearing loss. Speech perception can be especially vulnerable to the presence of background noise in a room with poor acoustical characteristics.[36]

What can we do to accommodate those with hearing loss? With excessive ambient noise, those with hearing impairments find it difficult to hear coworkers. We can provide sound management options such as sound-absorbing panels, carpeted floors, and workstation enclosures.

Strength, Flexibility, Dexterity

A Finnish study published in the journal Experimental Aging Research reveals that maturing workers lose an average of 20 percent of physical capacity—particularly muscle strength and flexibility—between their early 50s and late 60s.[37] Spinal flexibility, trunk muscle strength, and hand grip strength all decrease as we age.[38]

Maturing people are also prone to slower response times and back problems.[39] While there is less age related loss in strength of the upper extremities, older workers will still likely look for stability support, like armrests, when rising from a chair. Because of declining balance reactions and their reduced reach range, they tend to move more slowly and cautiously, relying on edges and grips to hold for stability.[40]

By age 40 average muscle strength is about 95 percent

of an earlier maximum in the late twenties; by age 50 it drops to about 85 percent; by age 65 only 75 percent is still available, with further declines thereafter.[41] According to the Canadian Centre for Occupational Health and Safety (CCOHS) workers in all industries lose 15 to 20 percent of their strength between ages 20 and 60.[42] Control of posture also declines, resulting in more frequent accidents due to loss of balance.[43]

Adults 50 and older take longer than younger adults to make similar movements, and the movements are less precise. These difficulties occur across a wide range of activities, from using a computer mouse to positioning a cursor on a computer screen to movements related to driving a car. On average, adults over 60 will be approximately one and a half to two times slower than their younger counterparts. Reasons for this include: poorer perceptual feedback, increased "noise" in the motor pathway, and strategy differences in approaching the task.[44]

While maturing adults may be affected by these declines in physiological functions, they may not affect overall performance of office work. Still, it's worthwhile to support age-related physical changes in the workplace because all age groups benefit from good ergonomics:

- Office furniture should fit the worker and be appropriate for the task. Attention should be paid to: workstation heights and angles; chair height, support, and adjustment options; and reach ranges of storage and filing as well as phone, data, and power connections.
- Because of limitations in flexibility and dexterity, fine motor movements like keyboarding or mousing can be difficult. We should consider alternative ways to navigate with input devices.[45]
- Arm supports should have a large, stable grip area to facilitate sit-to-stand and stand-to-sit movements.
- Storage could have U-shaped handles, push latches, and side-hinged doors to better accommodate age-related physiological changes. Consider the "closed fist rule": if it can be operated with a closed fist, virtually everyone can use it.
- Floors, doors, and walls should have changes in level marked with contrasting color or brightness as well as adequate lighting to reduce shadows; carpet should be thin, to reduce the incidence of trips and falls.

Cognition

The processing of information takes longer due to an aging central nervous system and more fragile short-term memory. In addition to a generalized slowing of central nervous system functions, aging disrupts decision-making processes.[46] Adults 60 and older have a smaller working memory in which to hold or compute information than younger adults; so linguistic processes require an especially heavy drain on working memory.

As length and syntactic complexity of sentences increase, maturing adults over 60 have significantly more difficulty than younger adults in sentence comprehension and accuracy recall.[47] Older people might be less accurate in recalling recent events, especially those involving specific details of time and

place. Long and complex instructions or questions may also be difficult for people over 60.[48]

Maturing adults have more difficulty in developing new automatic processes and the potential for decline in spatial ability with age can affect computer-related tasks. The response time to multitasking slows with maturation; generally, as the complexity of the task increases, the degree of slowing also increases. However, when performing simple tasks, older adults perform as well as younger adults.[49]

"It has been proposed that despite decreases in certain cognitive and physical abilities," claims Dr. Sara Czaja, PhD., Professor and Co-Director of the University of Miami's Center on Aging. "There is no observable decrease in older workers' overall performance, because what they lack in cognitive abilities they compensate for with an increase in job knowledge, skills, and various coping strategies."[50] The relationship between aging and work performance depends on the type of task, task experience, and training.[51] Some sources claim that some maturing adults can perform tasks demanding patience and experience-gained skills better than many young people.[52]

Older people are healthier than they have been in the past, and contemporary work relies more on the ability to process and manage information than on physical strength. Because of the growing age of our work force and the frequent desire to remain in the labor force into late adulthood, understanding the impact of age-related changes in cognitive function in work place performance is becoming a matter of some urgency.[53]

What can we do to accommodate changes in cognition for a maturing work force?

- Make the same actions consistent across different systems and tasks to decrease demands on information processing tasks.
- Use familiar terms and labels, making connections between concepts explicit to compensate for the linguistic difficulty mature adults—in their 60s—may have.[54]

Universal Design: Not Just For Older Workers

Considering design that supports the growing demands of older workers, as well as younger workers who may not yet show signs of physiological decline, benefits everyone in the long run. In addition, the increasing diversity of the work force has required designers and facility managers to consider the physical needs and preferences of women, maturing workers, people from greater variety of races, ethnicities, and cultural backgrounds, and of workers sharing jobs and working unconventional hours.[55]

Universal design is "necessary for the simple reason that the demographics of the work force are changing—not just in the U.S. but on a global level as well," says Robert Anders, professor of Industrial Design and head of Design Management at the Pratt Institute in Brooklyn, NY. "Besides that, Americans are becoming much more sophisticated about ergonomics. They will not put up with a poorly designed user interface in their car, home, or office."[56]

Universal design "proposes products be accessible to the widest range of people, from the very young to the very old, by taking all their limitations or disabilities into account...It's kind of a philosophical expansion of ergonomics, design values that became a buzzword in the 1980's for products promoted as user-friendly."[57] It applies techniques that appeal to a large cross-section of age groups and to those with a range of physical abilities and special needs.

The goals of universal design are to:

- Compensate for a reduced range of motion
- Compensate for reduced strength
- Assist mobility and agility
- Help with balance and coordination[58]

Many existing products answer the need to accommodate all individuals without costing extra. It's often simply a matter of choosing drawer pedestals with an easy-grip pull or adjusting work surface height. [59]

Task analysis is extremely important for early input into the design process, especially when designing for maturing adults. The ability to identify information needs, visual, auditory and tactile detection requirements, demands for focused attention and for retaining information in memory, reaction time to signals, and physical requirements such as digit manipulation and required forces provide a starting point for pinpointing problems that maturing users potentially face.[60]

In previous decades, most "universal design" products developed to help older people were utilitarian, often unsightly things: all function, no form. These days, manufacturers are taking pains to make these products more attractive, so they'll blend in.[61] "Designers are developing products that work better and more easily, and look beautiful, too, and so enhance everyone's lifestyles," says Mary Jo Peterson, kitchen and bath designer and universal design consultant.[62]

By demanding products that treat the aging process as normal, baby boomers are giving universal design a boost. In line with this philosophy, they want products that are safe, comfortable, easy to use, and look good. Because boomers have significant amounts of disposable income, they are getting the attention of designers and manufacturers in many environments—not just the office.

"Today's aging population is driving 'well into their 80s'," says Fred Lupton, ergonomics supervisor at Ford Motor Company. "So for car manufacturers, like Ford and others, accommodating aging drivers is a matter of financial sense. The last thing we want to do at Ford is build cars for older people because older people won't buy them."[63]

A lot is being done in the kitchen, too. Good Grips, a line of kitchen utensils introduced in 1990 by Oxo International was "the first big touchdown for universal design".[64] Their large, round, comfortable handles have become popular with boomers both by design and ergonomics. Originally marketing 15 utensils, Oxo has expanded their kitchen line to 350 items and will be offering tools as well.

An aging population is also demanding a more

accommodating home environment and appliance manufacturers, for example, are readily heeding the call to create appliances that work for everyone. Refrigerators and freezers are no longer limited to just one location in a kitchen: newer designs find the appliances tucked into under-the-counter drawer space that's readily accessible by cooks of all abilities, ages and sizes. Microwaves are being located at lower levels, rather than just over the stove, to be more convenient for their biggest group of users—children. Dishwashers are available as drawer models to reduce bending. Overall, the trend in kitchen design is to create a space that works for a multi-generational family, which makes the kitchen more livable, useable and convenient for any cook, according to Mary Jo Peterson.[65]

The lesson from these efforts is that creating environments that cater to aging eyes, tools that require less strength to operate, and workspaces positioned at heights appropriate for an aging body benefits all users.[66] What's good for the older worker is also good for the younger worker: making the environment healthier will help everyone as they age.

The "graying" of the work force is contributing significantly to the number of people coping with some hearing, vision, or mobility limitation, and projections suggest the percentages will increase.[67] It's time to address the needs of the ever-expanding Baby Boomer generation. Doing so will pave the way for design for generations to come.

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