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Why Office Design Matters

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You want to concentrate and collaborate, but how can you get the best of both worlds in your current office set-up? An excerpt from *Thinking for a Living: How to Get Better Performance and Results from Knowledge Workers*.

by Thomas H. Davenport

One factor that affects knowledge worker performance that isn't well understood is the physical work environment—the offices, cubicles, buildings, and mobile workplaces in which knowledge workers do their jobs. There is a good deal said about this topic, but not much known about it. Even more unfortunately, most decisions about the knowledge work environment are made without seriously considering their implications for performance.

In 2002 I and my then-colleagues at Accenture Bob Thomas and Sue Cantrell undertook a study of this issue.1 We interviewed forty-one companies that had some initiative under way intended to improve the performance of high-end knowledge workers, or those with particularly high levels of expertise and experience, who were critical to the organization's mission. We were interested in all the factors that affected knowledge work performance, but the topic most commonly addressed by the companies was the physical work environment (the other common ones were information technology and management). […]

The introduction of a new workspace was most often the catalyst for a broad redesign of the knowledge work environment in our study. Because it is so tangible, a new or alternative office can be both the symbol and a key part of the reality of new ways of working. For example, Pharmacia recently built a new pharmaceutical research building outside of Chicago that was intentionally designed to encourage more interaction among its R&D staff. The new workspace was intended not only to attract top research scientists to the company, but also to promote a more collaborative culture. Particular designs can encourage certain types of behavior, although they will never guarantee it. Of course, office space is also expensive, and savings resulting from decreased or alternative space often serves as a rationale for change.

Workspace design is a somewhat faddish phenomenon, in part because no one knows exactly what factors affect knowledge worker performance, and how those factors interrelate. In the absence of knowledge, vendors of office environments, architects, and developers are free to make all kinds of claims about what works. But we do know some things from the limited amount of research on this topic, and in the next section I'll provide a list of what is generally agreed to be true with regard to the physical work environment. Then I'll describe a framework that will help managers think about the physical environments for knowledge work in their own organizations.

What we know about the physical work environment
From either previous research, logic, or common sense, there are a few things we know about the relationship between physical work environments and knowledge worker performance. They include:

Knowledge workers prefer closed offices, but seem to communicate better in open ones. Of course there is great variation among open and closed office types, but the most extensive research in the area (from Cornell professors Frank Becker and William Sims) suggests that while most knowledge workers prefer closed offices because they are better able to concentrate, they communicate informally and build trust and social capital more easily in more open office environments (even high-walled cubicles, they say, restrict interpersonal communications). They note: "Our research, done with employees in job functions ranging from software development to marketing and business development, indicates that the more open the 'open' plan office environment, the more conducive it is to overall work effectiveness, when communication and interaction are critical elements of the work process."2 Becker and Sims are undeniably experts on this topic, but I feel that, like many corporate executives, they downplay the need for

concentration and quiet when knowledge work is done in office environments.

Knowledge workers congregate in particular geographical areas. This factor has been made well-known by Carnegie-Mellon professor Richard Florida in his book *The Rise of the Creative Class*. He documents the fact that knowledge workers (not synonymous with the "creative class," but closely overlapping it) are drawn to, and are made more productive by living in, cities and regions with concentrations of other people like themselves. Silicon Valley, Boston, and Austin are prominent examples of this phenomenon, at least for knowledge workers oriented to information technology. The connotation is that if you're a knowledge worker or a business that needs to hire them, you need to find out where the center of action in your industry is, and locate yourself there. If you're a city manager or mayor and you want these successful, taxpaying individuals to live in your city, you need to make your city attractive to them and to the businesses that hire them.3

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Knowledge workers move around in the course of their work. They need mobility and spend a lot of time out of their offices. Several firms that have observed their knowledge workers have found that they spend up to half of their time out of their offices—either in meetings, talking informally in other peoples' offices, or traveling. As a result, organizations need to provide them with the ability to work and be productive outside of their offices. The most obvious instantiation of mobile work environments is the laptop computer, but there are others—for example, access to physical work artifacts such as books and files, the ability to use telephones, computers, and messaging technologies while traveling.

Knowledge workers collaborate. They meet, they chat, they congregate. Office environments need to facilitate the collaboration and exchange of tacit (hard to express in explicit written terms) knowledge. What does this mean? At a minimum, there need to be meeting spaces and conference rooms. Maximum facilitation would be to create a variety of collaborative spaces, technologies, and facilitation approaches for an array of collaborative purposes. Technologies for collaboration—from videoconferences to webcasting to shared networks—are increasingly making a big difference in collaboration, but users are frustrated by technical difficulties in many cases.4 Very few, if any, organizations have attempted to foster collaboration to a high degree, in part because they haven't made the effort to understand what kinds of collaboration are needed.

Knowledge workers concentrate. The opposite side of the collaboration coin is the need to concentrate at work. This requires a quiet setting with relatively few distractions. Such an environment is particularly important for knowledge creation activities—thinking, writing, programming, designing, and so forth. This takes up a widely varying proportion of knowledge workers' time—some studies have found, for example, that programmers spend only 20 to 30 percent of their time doing solo programming, but others have found workers devoting up to 64 percent in "quiet work."5 Whatever the fraction of time, it's important for the production of final knowledge work outputs. Many organizations that have moved to more open offices trumpet the benefits of increased collaboration, but they discount the penalties incurred on the concentration side.

Knowledge workers work in the office. Despite many years of discussion about telecommuting and telework, a very small percentage—some studies suggest 5 percent—of workers do "serious" (full-time or near-full-time) telecommuting, and a good proportion of those are administrative workers rather than knowledge workers. Knowledge workers, like all other types of workers, like flexibility, and they like to work at home occasionally. However, they don't want their homes to be their only offices. They know that to be constantly out of the office is to be "out of the loop"—unable to share gossip, exchange tacit knowledge, or build social capital.6 This means that organizations should not bother with office arrangements that assume full-time telecommuting, even though occasional telecommuting doesn't save companies any money. It also means that firms that are committed to telecommuting may be less attractive in the knowledge worker labor market.

Knowledge workers communicate with people who are close by. Tom Allen, the dean of researchers on the work behaviors of scientists and engineers, found more than two decades ago that technical workers (a proxy for knowledge workers) whose desks are more than thirty meters apart have a frequency of communications that is roughly zero.7 Some might argue that e-mail and instant messaging have changed the relationship between physical proximity and communication. However, I'd argue that you rarely e-mail or IM intensely with someone you don't know. Assuming it's still true, Allen's important and oft-cited finding means that companies should design work environments so that knowledge workers who need to communicate are physically close to each other. Of course, this requires some strategizing about who needs to be talking with whom. Organizations such as 3M and Herman Miller have tried to do

just that in the design of some of their facilities.

Knowledge workers don't care about facilities gewgaws. At least there is no evidence that anyone ever took a job, stayed at a job, or worked more productively because of foosball, pool, or ping-pong tables, cappuccino bars, office concierges, hearths, conversation pits, quiet rooms, lactation rooms, creativity rooms, relaxation rooms, nap rooms, etc., etc. In these lean and mean times, many workers are even reluctant to be seen using these facilities for fear that they won't be considered hardworking enough. In any case, there's no clear relationship between knowledge worker performance and various appealing features of the work environment, though they may help slightly with recruiting or morale. To my knowledge only a couple of office furniture firms (Herman Miller and Steelcase, to be precise) do much to have an impact on such workplace innovations—and their focus is on broad workplace changes, not on architectural gewgaws—so we may never know for certain whether they are worth the money and the architect's time.8

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Despite the faddish nature of workspace design and the absence of detailed knowledge on its implications, many organizations truly believe in the effects of the particular approaches they have adopted. It is often assumed, for example, that open offices lead to increased collaboration and open communication. This was the goal at SEI Investments, where all dividers were torn down in favor of a big open room that, according to one SEI knowledge worker we interviewed, "creates a fun environment in which people can communicate freely." Of course, an HR manager at SEI admitted that only about half of the potential hires for the company thought they could stand working in such an open environment, which seems a high price to pay for architecture (although, to be fair, SEI believes that the environment is a good screening mechanism for the collaborative workers they want to hire).

Certainly there are many occasions in which chatting over cubicle walls has facilitated the flow of information through knowledge work processes. Yet we heard just as many anecdotes about workers who stayed at home to do heads-down work because they couldn't concentrate in the office. One knowledge worker involved with highly sensitive political risk analysis, for example, feared that his job performance would be severely compromised as soon as the firm moved to a completely open floor plan. And at Monsanto (which later merged with Pharmacia & Upjohn to form Pharmacia), where a business unit had attempted to do away completely with private offices to reduce hierarchy and increase communication, senior officers of the unit eventually erected their own private offices. Employees are skeptical of open office arrangements and often suspect (as do I) that the primary benefit of these designs is the lower space costs of packing more people into cubicle-structured space.

Similarly, mobility within the workspace and outside of it is a frequently cited objective. This obviously makes sense in industries such as professional services, where workers must travel to clients frequently. Yet we don't know what price organizations pay in social capital when employees are highly mobile and can't be easily located for a face-to-face conversation. "Hoteling," for example, or the assignment of workers to whatever workspace is available when they come into the office, is clearly an efficient means of allocating space to mobile workers, but several firms that have experimented with it report that it engenders about the same level of community we find in an actual hotel. How many friends have you made in hotels? When the person next door is different every day, informal social relationships don't develop easily. WK

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Thomas Davenport holds the President's Chair in Information Technology and Management at Babson College. He is director of research for Babson Executive Education, an Accenture Fellow, and author, coauthor, or editor of ten books, including *Working Knowledge: How Organizations Manage What They Know* (Harvard Business School Press, 1997).

Footnotes:

1. Dave De Long was also involved in the early phases of the study. Aspects of it were described in Thomas H. Davenport, Robert J. Thomas, and Susan Cantrell, "The Art and Science of Knowledge Worker Productivity," *Sloan*

Management Review (Fall 2002): 23-30.

2. Frank Becker and William Sims, *Offices that Work: Balancing Cost, Flexibility, and Communication*, Cornell University International Workplace Studies Program, October 2001. Available online at http://iwsp.human.cornell.edu/pubs/pdf/IWS_0002.PDF.

3. Richard Florida, *The Rise of the Creative Class* (Basic Books, 2002), and "The Economic Geography of Talent" (working paper, available online at http://www.creativeclass.org/acrobat/AAAG.pdf.

4. M. Lynne Markus, "IT Support for Global Collaboration," Information Work Productivity Council Research Report, January 2004.

5. McCue (1978) found 20 percent of programming work was solo; Zelkowitz, Shaw, and Gannon (1979) found 20 percent was individual coding; Brill (2000) found 64 percent quiet work. All cited in Becker and Sims, *Offices that Work*.

6. For a discussion of the role of physical facilities in building and maintaining social capital, see chapter 7 in Don Cohen and Laurence Prusak, *In Good Company: How Social Capital Makes Organizations Work* (Boston: Harvard Business School Press, 2001), 155-182.

7. Thomas J. Allen, *Managing the Flow of Technology* (Cambridge, MA: MIT Press, 1984).

8. For the Steelcase approach to measurement, see "Measuring Business Results: The Role of the Workplace," online at http://www.steelcase.com/na/knowledgedesign.aspx?f=10255&c=10907.