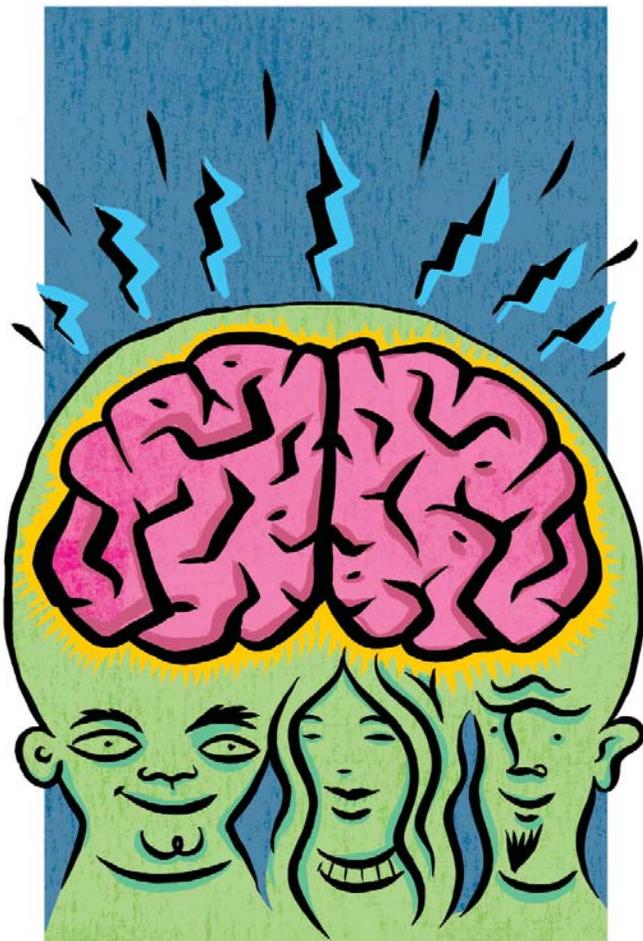


## Making Room for Collaboration

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In a constantly and rapidly changing business environment, organizations increasingly look to collaborative work processes to stimulate practices that will generate market value and gain competitive advantage. But while everyone seems to agree that collaboration is a good thing, business leaders and consultants often have differing ideas on what collaboration is and how—or even if—it can be managed and supported.

In fact, “collaboration... is a word with fuzzy but modern overtones. Collaboration suggests something more intense than coordination and less all-inclusive than community. Collaboration is sometimes used interchangeably with cooperation, although it suggests both a deeper level of involvement with others as well as some creative output, whether that be a product, a process, or an ongoing discussion.”<sup>1</sup>

The elusiveness of collaboration certainly hasn’t diminished its perceived importance, however. In a recent survey of 1,656 executives from 100 countries, a majority said that it is vital to the future of their organizations. The survey results found that “increased collaboration will be a defining feature of the company of 2020. Executives expect to see a lot more collaborative problem-solving inside and outside their firms, and clear majorities intend to create employee incentives to encourage collaboration across functions (79 percent) and with external stakeholders (68 percent).”<sup>2</sup>

If collaboration is so vital, what is the recent thinking about the structure and value of collaborative practices? And how can organizations use their physical facilities to encourage and support those practices?

## Collaboration = Knowledge Sharing

Stephen Kosslyn, a professor of psychology at Harvard University, has noted that “people often grapple with problems in groups, be they formally designated teams or casual huddles around the water cooler. Just as a mechanical calculator can extend our mental capacities, other people help us extend our intelligence—both in a cognitive sense (as required to solve problems) and in an emotional sense (as required to detect and respond appropriately to emotions, ours, and those of others).” In this way, he explains, other people can serve as extensions of our own brains, filling in for our individual cognitive and emotional limitations. He believes that as researchers come to understand how collaborative groups arise and operate, they will learn how to increase human intelligence.<sup>3</sup>

This understanding of collaboration as a means of sharing knowledge and extending human capabilities represents a new focus for the study and development of work groups within the organization. Where the emphasis had been on teams—operational teams, project teams, cross-functional teams—as a means of accomplishing specific tasks and goals, viewing collaboration as a means of managing knowledge gives group interaction a deeper, more pervasive role in the organization. Individuals working together to create, share, and use knowledge are seen as essential to the effective real-time development and implementation of strategies that form the basis of organizational success. Collaboration has become a survival skill.

As a recent report by the New Paradigm Learning Corporation, a research and consulting firm, notes, “The exchange of knowledge among individuals or teams leads to innovation and the generation of new capabilities. And as the market evolves at increasing speed, competitive advantage will come from building capabilities faster than others.” The report goes on to emphasize that collaboration can no longer be viewed as a progressive management tool to be employed by certain types of corporations with “open” cultures, but a practice that must be embraced by any organization hoping to survive and succeed in today’s business environment. “Real collaboration is hard work. But there is no avoiding it: Businesses that embrace collaborative networks of knowledge exchange—via the right technologies, processes, and culture—will be able to build capability at a pace that will keep them competitive.”<sup>4</sup>

## Tacit Versus Explicit Knowledge

The first step in understanding collaboration as a way of managing knowledge is to be clear about what knowledge is. Experts in the field of knowledge management emphasize that knowledge is more than information and that knowledge sharing is not the same as sharing information. According to Hubert Saint-Onge of New Paradigm Learning, knowledge is “the ability to take effective action. It is information that has been validated, generally in a social context where individuals have confidence in one another.”<sup>5</sup>

Unlike information, knowledge is not something that can be stored in a database or transferred completely by means of written or verbal instruction. In fact, knowledge is often acquired without the use of

language, by observation, imitation, and practice.

We all know more than we can tell, and the part we can’t tell is often communicated through joint activity or simply being around other people—in other words, through collaboration.

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In a research survey conducted by Xerox that asked corporate employees where knowledge was stored in their company, most responded that knowledge was stored in employees’ heads, rather than on paper or in electronic formats.<sup>6</sup> This unwritten, or tacit, knowledge—the “know-how,” intuition, memory, and internalized experience that exist in and between the minds of the individuals that make up an organization—is the knowledge that is essential to the organization’s ability to create, innovate, and produce value on a continuous basis. And it is in the transfer of this knowledge, in the constant, dynamic interaction between learners and teachers that the real power of collaboration resides.

Where old theories of learning focused on transfer of knowledge via documentation and training, learning theorists today see learning as a social interaction in which knowledge is communicated in more “real” and meaningful contexts. People “construct their understanding out of a wide range of materials that include ambient social and physical circumstances and the histories and social relations of the persons involved,” write researchers John Seely Brown and Paul Duguid. “Learning is essentially becoming an ‘insider’—learning to function within the community. Learners are not acquiring explicit, formal ‘expert knowledge,’ but the embodied ability to behave as community members.”<sup>7</sup>

The model of knowledge creation that scholars Ikujiro Nonaka and Konno Noboru advocate is a continuous loop in which tacit knowledge is communicated through physical experience and face-to-face interaction and then converted to explicit knowledge through dialogue and documentation. Once the newly explicit knowledge is internalized through use and practice, it once again becomes tacit, and the cycle repeats.<sup>8</sup>

This view of knowledge as “value in waiting,” surrounding us always and emerging only when we work together to resolve problems and meet challenges, calls for a different approach to knowledge sharing than has been traditionally applied in business organizations. For example, a study of “corporate knowledge management in action” cites a large enterprise that invested millions of dollars in a “skill-pool database” documenting past assignments and problem solutions, only to find that employees didn’t use the database, preferring to go to their colleagues for answers instead. In this and many other instances, the researchers found that coworkers were not necessarily able to use the knowledge of others simply because it was written down, and that most employees believe that the most valuable knowledge sharing takes place while talking to colleagues.<sup>9</sup>

### Communities of Practice

Research on how tacit knowledge is transferred within and across organizations has focused on “communities of practice”—informal networks that form around a common work-related interest or goal to share experiences and “best practices.” A typical organization will have many different communities of practice, and most people belong to more than one. Theorist Etienne Wenger, who first popularized the term, defines communities of practice as “groups of people who share a concern, a set of problems, or passion about a topic and who deepen their knowledge and expertise in this area by interacting on an ongoing basis.”<sup>10</sup>

Wenger says that, while these kinds of work-related social groups have always existed, companies are just now beginning to recognize their power as a strategy for managing tacit knowledge. “From a business standpoint,” he writes, “the tacit aspects of knowledge are often the most valuable. They consist of embodied experience—a deep understanding of complex, interdependent systems that enables dynamic responses to context-specific problems. This type of knowledge is very difficult for competitors to replicate.”<sup>11</sup>

However, communities of practice by their very nature are not easily “managed.” They tend to form spontaneously—not by management fiat—and participation in them is a personal, self-motivated choice. But while organizations can’t establish communities of practice the way they develop organizational structures or project teams, they can provide conditions that encourage communities of practice to form and that help them to flourish.

As an example, one company, puzzled as to why it took employees so long to set up services for customers, finally hired an anthropologist to analyze the interactions of the people involved in the process. She found that the various departments responsible for pieces of the process never communicated informally, and so had little understanding of each other’s roles and little opportunity or incentive to work on solving problems together. When the company relocated the process participants so they were all working in the same area, informal communities of practice grew up

around the various tasks involved in the process, and the time to complete it was cut from 17 days to three.<sup>12</sup>

Other researchers have found that “high levels of interaction and communication are linked to innovation and

reduced time to complete projects.”<sup>13</sup> An example of this is the NASA Jet Propulsion Laboratory’s Team-X. It has consistently reduced the time it takes to complete tasks for hundreds of projects from three to nine months down to a few days. Ethnographers who studied the team in action found that part of the reduction could be attributed to the absence of “a bottlenecked management hierarchy” and the presence of an efficient knowledge network that was both explicitly designed and naturally evolved.<sup>14</sup>

### Importance of a Shared Environment

In fact, evidence suggests that “co-location” may be the single most effective way to promote and support communities of practice, simply because nonverbal behavior plays such a central role in the transfer of tacit knowledge. When people are physically near each other, they have the opportunity to signal and understand each other without words, and common ground is easier to establish when people converse face to face and can read each other’s body language and other nonverbal cues. Co-location also affords the opportunity for spontaneous encounters that promote social relationships and collaboration.

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Most employees believe that the most valuable knowledge sharing takes place while talking to colleagues.

Some years back, a group of workplace researchers at MIT came up with the “30-Meter Rule,” which says that the frequency of one person’s interaction with another person sitting more than 30 meters (about 99 feet) away is about the same as if the two people were located in different buildings (or cities).<sup>15</sup>

Proximity is perhaps the surest predictor of interaction, and some research suggests that sharing tacit knowledge simply doesn’t happen without a shared work environment. As one research group reports, “When people across distance collaborate, and lack the experiences of a shared work environment, interaction is hindered. Without much prior shared experience of working in the same environment, implicit knowledge is not transferred among people when they are at different sites.”<sup>16</sup>

One reason for this is the amount of “environmental monitoring” that goes on daily in the workplace. Even when they don’t appear to be listening or engaged in the conversation and activity of others in the immediate vicinity, people are attending on some level to what is going on around them. Ethnographic studies have shown that, by monitoring the environment, workers “can detect opportunities and reasons to interact, see the problems and solutions that their colleagues deal with. This enables sharing of knowledge and advice. And enables learning.”<sup>17</sup>

A shared location also enables learning by observation. Watching how others interact with coworkers, react in a crisis, or use shared documentation and technology, is a powerful tool for understanding everything from the most practical matters to internalizing corporate culture and values and “the way things are done here.” In a shared setting, the use of shared materials and equipment is visible to everyone in the room, allowing people to adjust their behaviors to coordinate their use. Watching how others use these “artifacts” can lead to a shared understanding of their use and the interaction around them.<sup>18</sup>

Organizational design experts believe it is often worth the cost and effort to move or even geographically transfer key employees so they can be physically located together. Studies have found that virtual communication alone is never “enough to spark effective collaboration among community members. Many people are reluctant to ask colleagues whom they don’t know for help.”<sup>19</sup>

Knowledge sharing relies to a great extent on the kind of social connections and informal interactions that only happen when people meet face to face.

Even with the development of sophisticated technology designed to promote virtual collaboration, being physically present will continue to be a requirement for certain groups. Professors Gary and Judith Olson of the University of Michigan write that, “Collaborative work at a distance will be difficult to do for a long time, if not forever. There will likely always be certain kinds of advantages to being together....We will find uses for [present and future collaborative technologies], and descriptions of collaborative work in the future will enumerate the emergent social practices that have put these technologies to useful ends. But it is our belief that in these future descriptions distance will continue to matter.”<sup>20</sup>

## Designing Collaborative Space

A number of studies suggest specific ways that organizations can use the physical environment to support and stimulate communities of practice and

knowledge sharing. It’s interesting to note that much recent learning on the subject has come from computer scientists who are trying to understand the salient features of a shared physical environment in order to emulate those features in software designed for use by groups who are not co-located.<sup>21</sup>

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### 1. Location, location, location

Given the importance of face-to-face communication and casual and unplanned interactions—and in light of the 30-Meter Rule—location of individuals within an office space is an important consideration in configuring a knowledge space. This includes the placement of employees and the distances between them. Exchanges are dependent on physical location, and the closer the offices, the more likely people are to interact.

In addition to proximity, research suggests that the ability to monitor the presence and “interruptibility” of another person is a key enabler for interactions in which one person seeks out another for discussion. One study found that 80 percent of office interactions were unplanned and occurred as a result of one person perceiving that another was available for conversation, i.e., not currently involved in focused work.

The researchers conclude that designing space to maximize visibility will also maximize the number of interactions among coworkers.<sup>22</sup> Visual access to other group members also enhances the nonverbal communication and learning by observation that is so crucial to the transfer of tacit knowledge and trust building.<sup>23</sup>

## 2. Visual display

Since knowledge work is a largely cognitive activity, its processes are mostly invisible. Tacking surfaces, white boards, and technological tools such as projection and large video displays allow people to illustrate ideas and post thinking-in-process to make the work visually accessible to the group, aiding memory and the organization of tasks and materials. An integral part of communication, visual display helps to document, reinforce, and focus group members on a shared project or idea and encourage participation.<sup>24</sup>

Information displays that chart the decisions and reasoning behind a particular piece of work or track the history of a project from its inception can be powerful learning tools, sharing knowledge that may be lost or hidden when a report or design is seen only in its final, polished form. The design and location of visual displays and artifacts also influence the effectiveness of knowledge transfer and the coordination of efforts among group members. Placement that allows ready viewing and evaluation by people as they sit at work or move along a routinely traveled corridor can heighten shared awareness.<sup>25</sup>

Displays that allow people to stand around them in a circular formation—a three-dimensional model placed on a round table, for example—have a particular power for group interaction, through the creation of a “shared transaction space.” When people stand in a circle or surround a table, their transaction spaces overlap to form a shared one. As one researcher explains, “Establishing, changing, and leaving one of these overlapping formations correlate with beginning, participating in, and ending a social interaction, and changes in the formation give subtle social signals. Since people seem to interpret its establishment as an indication that social interaction is appropriate, implicit creation of the formation might stimulate group interaction.”<sup>26</sup>

## 3. Layouts and traffic patterns

Observational studies have found that interactions are often the result of movement patterns and occur in or near personal workstations and well-trafficked corridors.<sup>27</sup> Pathways that meander around workstations and shared equipment such as printers or photocopiers provide more opportunity for ad hoc encounters than strictly linear layouts can offer.<sup>28</sup>

Here again, visual access is key. One study found a high correlation between frequency of interaction and the number of individuals who can be seen from any point along a given circulation path.<sup>29</sup> Another observational study comparing two groups of employees housed in different buildings with different layouts found that the group working in the building with a maze-like layout and low visibility had far fewer spontaneous interactions than the group working in the building with clustered workstations, higher degrees of interior visibility, and a circulation system with a strong central path. In general, layouts with the greatest number of connections to other spaces had more interaction among workers.<sup>30</sup>

Most of the research looking at traffic patterns and office layouts found that

informal interactions were more likely to take place in corridors or at workstation entrances than in areas such as copy rooms or even coffee nooks designed to accommodate casual meetings and exchanges. As one report put it, “The pathway seems more important than the destination.”<sup>31</sup>

### Balancing Solitude and Interaction

Of course knowledge work does not consist entirely of social interaction, and even in the most collaborative environments, one person’s interaction is often another person’s interruption. A supportive work environment has to offer the opportunity for the privacy and solitude for people to focus on solitary work as well. The need for protection from distraction and interruption is often at odds with the goal of promoting interaction and enabling the kind of environmental monitoring that allows the transfer of tacit knowledge. As one researcher writes, “This is the central dilemma of collaborative work environments—providing effective support for both interactive and individual work.”<sup>32</sup>

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**This is the central dilemma of collaborative work environments—providing effective support for both interactive and individual work.**

While co-location, proximity, and visual access have obvious benefits for knowledge sharing and picking up information relevant to one's own work, interruptions have a cognitive cost in the time it takes to reorient oneself to the task at hand. Just how disruptive an interruption is depends on the context in which it occurs. One observational study found that situations where interruptions were considered negative events included those that occurred during tasks that require a lot of concentration and those that result in losing one's train of thought for the task at hand. In contrast, interruptions that were related to the interruptee's current work were often considered fortuitous or beneficial.<sup>33</sup>

Interestingly, this study found that co-location and visual access actually reduced the frequency of "negative" interruption experiences. Co-located people went longer between interruptions (11 minutes and 56 seconds) than people who were physically separated from their teammates (9 minutes and 56 seconds). Researchers concluded that this was due to the fact that people working in the same physical location were aware of when their colleagues were busy and when they might be open to interaction.<sup>34</sup>

Providing individual workspaces that allow people to position themselves to signal levels of concentration and openness to interaction can aid this process. Glass partitions that allow visual access but block auditory incursions may be a solution in some instances, although they will deter the kind of environmental monitoring that allows workers to offer suggestions or support when they overhear colleagues grappling with a relevant issue or problem.

Another solution is to provide enclosed spaces where individuals can work for periods of time undisturbed, or to allow people to work at home in certain situations. However, research shows that the kind of mobility working this way requires is more difficult to achieve than formerly anticipated. People continue to rely heavily on paper documents and reference materials, and a full complement of technological devices—printer, full-screen monitor, etc.—is often necessary.<sup>35</sup>

Research suggests that more effective solutions to the problem of providing a balance between the need

to interact and the need to work effectively at individual tasks will come as we learn more about the relationship between cognitive processing and workstation design. Instead of the current focus on reducing distractions and interruptions from other people, for example, a cognitive approach to design would consider how to improve the immediate work environment by reducing the factors that contribute to sensory overload while adding features that aid cognitive processing.<sup>36</sup>

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## A cognitive approach to design would consider how to improve the immediate work environment by reducing the factors that contribute to sensory overload while adding features that aid cognitive processing.

As cognitive scientists and designers collaborate to develop these kinds of work environments, Professor Kosslyn's optimism about collaboration leading to a dramatic increase in human intelligence may prove well founded.

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