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The Collaborative Organization:
How to Make Employee Networks Really *Work*

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The traditional methods for driving operational excellence in global organizations are not enough. The most effective organizations make smart use of employee networks to reduce costs, improve efficiency and spur innovation.

BY ROB CROSS, PETER GRAY, SHIRLEY CUNNINGHAM, MARK SHOWERS AND ROBERT J. THOMAS

AS INFORMATION TECHNOLOGY becomes increasingly critical within large, global organizations, chief information officers are being held to ever-higher performance standards. A recent survey of 1,400 CIOs illustrates this mandate, with streamlining business processes, reducing enterprise costs and improving work force effectiveness at the top of their agendas.[1] But beyond providing efficient operational support, top management increasingly expects the IT department to be a strategic business partner — to forecast the business impact of emerging technologies, lead the development of new IT-enabled products and services, and drive adoption of innovative technologies that differentiate the organization from competitors.

CIOs often try to address these challenges by relying on the same managerial tools they use to pursue operational excellence: establishing well-defined roles, best practice processes and formal accountability structures. However, our research shows that such tools, though valuable, are not enough. The key to delivering both operational excellence and innovation is having networks of informal collaboration. Within IT organizations in large global companies, we have seen that innovative solutions often emerge unexpectedly through informal and unplanned interactions between individuals who see problems from different perspectives. What's more, successful execution frequently flows from the networks of relationships that help employees handle situations that don't fit cleanly into established processes and structures. (See "About the Research," p. 85.)

CIOs who learn to harness and balance both formal and informal structures can create global IT organizations that are more efficient and innovative than organizations that rely primarily on formal mechanisms. However, even

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THE LEADING QUESTION
How can companies build more collaborative and innovative organizations?

FINDINGS

▶ Executives should analyze employee collaboration networks to discover how high-performing individuals and teams connect.

▶ Networks should be designed to optimize the flow of good ideas across function, distance and technical specialty.

▶ Network analysis can show where *too much* connectivity slows decision making.

Some collaborative networks are clearly superior to others, but employees aren't given guidance about how to form them.

though individual employees may be able to identify local patterns of collaboration, broader configurations of informal collaboration tend to be far less visible to senior leaders. In the face of this reality, we have found that organizational network analysis offers a useful methodology to help executives do two things: assess broader patterns of informal networks among individuals, teams, functions and organizations, and then take targeted steps to align networks with strategic imperatives.[2]

Network survey and analysis software allows senior managers to gather a wide range of data from employees about their collaborations — for example, whom they look to for information and expertise, whom they engage with on routine decision making, whom they turn to when dealing with problems that require more innovative brainstorming and how much time they invest in specific collaborations. Deeper insights emerge when employees are asked to characterize the nature of their relationships — for instance, whether the interactions leave them feeling highly energized or drained.

In addition to providing critical information about key network junctions, network analysis helps senior managers detect structural problems — such as hidden logjams that slow the network down or gaps that undermine strategy execution. Senior leaders who understand the broad patterns of employee interactions and what makes for effective internal networks have opportunities to reduce collaborative costs and network inefficiencies. They can work to improve performance in four critical ways:

Attain benefits of scale through effective global collaboration: Organizations can construct teams to leverage diverse expertise and drive adoption of new ideas across geographies. By carefully studying collaboration challenges across functions and geographies, they can identify gaps and enhance connectivity and best practice transfer in targeted ways.

Drive work force engagement and performance: Uncovering the network characteristics of high performers can show employees who play similar roles how to improve their own performance. It can help leaders identify the individuals who energize the organization and how to leverage their contributions.

Align collaborative with business partners and external stakeholders: CIOs need to know how effectively their units serve the needs of business stakeholders. By creating a detailed map of the existing cross-departmental relationships, they can see where innovations are occurring, where sufficient support is being provided and where investments should be made.

Minimize network inefficiencies and costs: Although collaboration is often seen as a virtue, too much collaboration at too many organizational levels can be a negative. It is important to reduce network connectivity at points where collaboration fails to produce sufficient value.

1. Attain Benefits of Scale Through Effective Global Collaboration

Because technology decisions often vary considerably from country to country due to local laws, standards and languages, IT organizations tend to optimize their operations locally rather than globally. That can lead to tremendous redundancies in expertise, capabilities and technology investments as well as fundamental incompatibilities across geographies. Within the IT organizations we examined, many islands of expertise rarely collaborated outside of their own operational unit. Yet benefits of scale — such as faster innovation through technology transfer and more access to expertise — required having connections across geographies.

As CIOs increasingly focus their attention on collaboration-intensive priorities such as linking business and IT strategies, and leading enterprise change initiatives,[3] they often deploy new communication technologies and ask for more collaboration from employees. But when leaders forget that communication is not the same as collaboration,[4] their efforts end up simply layering new communication obligations on employees who are already overworked.[5]

Every large IT organization struggles with the challenge of how to enhance collaboration appropriately across the varied technical groups and the business units it supports. For Monsanto Co., the global agribusiness company, the potential for gains came into focus in 2007 when senior management evaluated the success of a global team of employees implementing a new global transaction system.

Many of the team members had previously collaborated with one another, and these prior connections proved invaluable in establishing a foundation of trust that allowed the group to become productive quickly. The results were impressive: Instead of phasing in the new transaction system as a series of individual projects within each region, the team was able to orchestrate a single global rollout. It was more than a matter of taking advantage of strong internal networks; the team also leveraged an external network of contacts that spanned multiple regions and helped build support for the initiative and drive adoption. Based on the group's performance, management investigated potential productivity and quality improvements that might be possible if the key elements of its success were adopted across the company's entire 1,200-person IT organization.

Building Lateral Networks One early effort involved the creation of a global virtual network whose goal was to standardize infrastructure. Like many organizations, Monsanto had operated on a variety of computing platforms and software standards, most of which evolved from local decisions. Some managers thought that the best approach was to establish a strong central authority to push for companywide standardization. But top leaders wanted to build on what they had learned from the successful transaction system project; that meant creating a virtual team of experts from around the world, thereby giving each region a voice. Team members were selected based on their strong personal networks across the organization and their deep local ties. Their reputations as effective collaborators helped members negotiate creative solutions, and their local ties helped them secure buy-in from their colocated colleagues. After successfully rolling out common client platforms globally, the team went on to define and support a standard technology road map for all of Monsanto.

Following the same basic approach, Monsanto's IT leadership created more virtual teams to tackle specific technology challenges. For example, one team worked on best practices for software architecture, including how to leverage local applications in different geographical locations. In the process, it formulated a global best practice review process

ABOUT THE RESEARCH

Over the past six years, we have conducted network analyses of information technology functions in 12 large organizations in the utility, pharmaceutical, petrochemical, professional services and high-technology industries. Our research has employed statistical tools and methods for identifying and analyzing relationships between people, known as organizational network analysis, to assess both internal and external networks to identify opportunities for improving collaboration for significant business impact.

Typical network analyses involved engaging senior leaders to identify specific challenges and opportunities facing their organization, and then developing survey questions to elicit relationships (for example, "Please indicate the degree to which you typically turn to each person below for information to get your work done," or "Please indicate the degree to which you seek each person out for input or approval prior to making key decisions in your work"). We then used a custom survey engine to streamline the data collection process and network analytical software to produce diagrams, tables, scatter plots, charts and other metrics and visuals to identify key patterns and points of interest. That allowed leaders to see the strong and weak parts of the organization's networks — for example, the degree of connectivity between people, roles, teams and departments, and the fragmentation points. Such analyses enabled IT leaders to conduct follow-up interviews and to design and implement performance improvements aimed at increasing collaboration.

that included a methodology for relating new applications to measurable business outcomes (both in terms of return on investment and process improvements) and used its global contacts to ensure broad adoption.

Because the virtual teams addressed cross-organizational issues and were composed of employees from around the world, team members were able to gain visibility both within their teams and externally. It was more than having good social connections: Our network analysis showed that team members were more frequently sought out for their expertise and insights, and that others in the organization often turned to them to discuss new opportunities or to solve difficult problems. As a result, individuals participating on teams were 55% more likely to be cited as top performers during the company's annual performance review process than those who didn't participate.[6] As one team member explained: "In many ways, I am a bridge builder — I know what's happening in each part of the world, and I can often put people in touch with one another."

Having a detailed view of the networks of connections among team members provided Monsanto's IT leaders with a variety of options for altering the configurations and dynamics of teams to make them more successful. For example, we saw that teams that were held together by only three or four people had specific vulnerabilities; in one case, the departure of a few key people reduced the level

of connectivity among those who remained by more than 50%. To improve their resiliency, these teams needed to shift responsibilities to less-connected members. Teams that were focused too heavily on the company's U.S. base needed to find ways to build bridges to people outside the United States.

In determining the best intervention strategies for a particular team, it is helpful to be able to visualize the existing network configuration. For example, in a 40-person team made up of fragmented subgroups that were only sparsely connected, improving collaboration efficiently meant finding ways to connect the "peripheral connectors" — that is, individuals who linked two or three other members to the rest of the team. (See "Targeted Efforts to Improve Team Connectivity.") That meant identifying a small number of new connections that would have the biggest positive impact on team connectivity (without overburdening the most central connectors or creating major collaboration burdens for other team members).

Reducing Network Silos Network analysis also helps managers assess the health of cross-organizational collaboration — for example, connections across functional lines, physical locations and technical specializations — while also suggesting improvement opportunities. Our research at Monsanto revealed shortfalls in cross-unit connectivity. For instance, only 13% of the ties between employ-
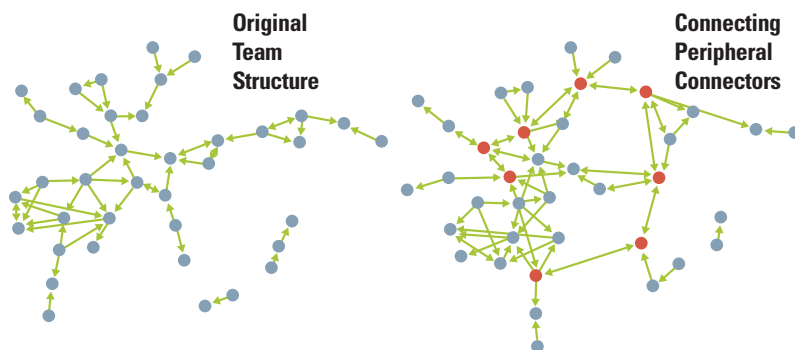
ees linked across locations, and only 35% spanned different IT units. In the United States, the insularity was particularly acute: IT employees were connected almost exclusively to individuals in their own region. To help Monsanto's IT leadership deliver on its goal of bringing a global and multi-expertise perspective to bear on key initiatives, we looked for opportunities to enhance collaboration across function, distance and technical specialization.

Our analysis of gaps in collaboration across functions at Monsanto found that only 19% of the lateral connections across IT units were high-priority opportunities for new value creation; indiscriminately pushing for greater collaboration would waste time and resources on the majority of gaps (and likely would not benefit the organization). Focusing on high-priority cross-unit gaps also helped senior leaders uncover and address underlying drivers — for instance, misaligned incentives, a lack of information about expertise that might exist in another unit, or two managers who simply don't get along. Just as different gaps had different causes, remedies also had to be tailored to the specific circumstances.

Of course, the challenges of improving collaboration within IT organizations are not unique to Monsanto. Across the range of organizations we studied in a variety of industries, network analyses helped us spot potential problems before they emerged as serious issues. In one instance, we found that two IT units that worked closely with each other were only connected by a handful of individuals: Losing five key people would result in a 56% drop in cross-unit connections. That prompted IT leadership to consider ways to generate more connectivity at that critical network juncture: formal project-level collaboration mechanisms, operational assignments around specific points of interaction and liaison roles to help create new connections.

2. Drive Work Force Engagement and Performance

IT organizations are often heavily focused on measurable goals and operating metrics that reveal when a project or process is working well and when it isn't. Unfortunately, that takes the focus off of things that are harder to measure (for example, work practices, collaboration and documentation). Our approach to

TARGETED EFFORTS TO IMPROVE TEAM CONNECTIVITY

Visualizing networks helps leaders diagnose collaboration challenges and design highly efficient and effective change programs. For example, connecting peripheral connectors in this team increases the number of people who can be reached indirectly through a mutual contact by 41%. This impact is four times larger than an untargeted effort to enhance connectivity, which in this case would produce only a 10% improvement.

Original Team Structure

Connecting Peripheral Connectors

improving collaboration effectiveness has been to study the networks of high performers. Across the various research sites, we found that high performers don't just have networks that are large; the most effective networks connect to people with diverse expertise, from a broad range of functions and across different locations. CIOs can leverage these findings through initiatives that help to replicate the networks of high performers through leadership programs, career management processes, staffing efforts, on-boarding programs and mentoring relationships. Such insights, although frequently role- and company-specific, can be helpful to average performers seeking to understand the success of top performers.
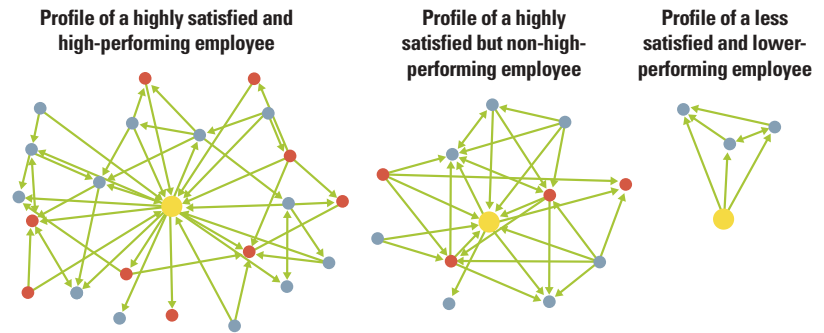
At a major management consulting company, for example, IT leaders focused on identifying collaboration best practices to help employees better understand how their networks facilitated (or hampered) their performance. Top-performing IT employees had strikingly different networks from their colleagues, which gave them access to the best expertise available, not just what was physically nearby.

But we also found that the specific characteristics of high performers' networks differed from role to role and company to company. The differences included network size, composition and boundaries spanned. For example, at the management consulting firm, high-performing support desk employees had more value-creating ties with technology-focused developers and systems operations people, while top vendor managers had better ties with project managers. At another company, we found that high-performing programmers maintained smaller and more focused networks by eliminating noncritical connections. That stood in stark contrast to high-performing quality assurance engineers, who built more extensive networks of collaborations across a range of roles. At a third IT organization, the most effective infrastructure designers had many more ties that reached beyond their own unit, while high-performing programmers had more connections to people within their unit.

In addition to identifying those with whom high performers were connected, we also found important differences in how they interacted with people

CREATING ENERGIZING TIES

Creating energizing ties involves a set of behaviors that leaders can help develop across their employees. The ability to create energy in networks is closely linked with employee performance and satisfaction (high performers in red, non-high performers in blue).

Profile of a highly satisfied and high-performing employee

Profile of a highly satisfied but non-high-performing employee

Profile of a less satisfied and lower-performing employee

in their networks. People who were connected to high performers were much more likely to report feeling energized by the interactions (when compared with interactions with average performers); high performers were also likely to have contacts that they found more energizing than average.[7]

We intuitively know the characteristics of high-energy coworkers: They interact with others in ways that leave people feeling good about themselves, they strive to help others accomplish long-term goals, and they act with integrity, honesty and thoughtfulness. Across a range of organizations we found that the more energizing ties employees have, the more satisfied they are, and also the more trusted they are in the eyes of their peers. (See "Creating Energizing Ties.") It benefits leaders to identify these energizers, as they are often the ones who inspire highly skilled knowledge workers to bring their best to the organization each day. Although most organizations have only a small number of employees in this category, their impact can be disproportionately large; in the consulting firm's IT organization, for example, 10% of the employees accounted for 26% of the energizing relationships, employees reported.

At the same time, network analysis can also help managers identify which employees are disengaged — and who might be at risk of leaving the company or is struggling to be successful. For example, at a professional services firm we studied, the IT employees who voluntarily left the company had significantly fewer energizing ties to colleagues than those who stayed. Across several organizations that

we followed over multiple years, there has been a consistent pattern: Long before they quit, the at-risk employees were sought out by significantly fewer colleagues than their peers. Although being less sought out can sometimes reflect weaker capabilities, connecting valuable at-risk employees to the right colleagues (for instance, through mentoring programs) can change this destructive, often invisible dynamic.

3. Align Collaborations with Business Partners and External Stakeholders

Innovation often involves migrating ideas from one context to another.[8] In IT organizations, this frequently entails exposing employees to the experiences and ideas of colleagues from other areas. Therefore, we found it helpful to create a map of the IT organization's ties to key business partners and external stakeholders to show CIOs where individual IT units needed to invest more (or less) collaborative time. For example, in studying the IT function of a major online retailer, we traced three indicators: (1) the average number of employee ties to each business unit; (2) the percentage of ties that were related to problem solving; and (3) the degree to which IT employees found the interactions energizing. That enabled us to see which business units were engaged in interactions that were innovative (that is, had high-energy interactions focused around generating new kinds of solutions) and which had low-energy information exchanges.

We produced similar maps at other companies to help executives understand how well their units were connecting to external organizations (such as vendors, colleagues in other companies and professional research companies), which allowed them to see how readily ideas from outside the company were being tapped. In addition to seeing if they had the right external relationships, executives could also see if good ideas were reaching the right internal stakeholders. For example, the IT department at a global technology manufacturing company had significant efforts in place to encourage its employees to become more innovative. Despite this, leaders were surprised to find that two-thirds of the innovation-related interactions internally were concentrated among just 10% of the employee base.

Effective innovation often requires striking a balance between external connectivity and internal influence. To ensure uptake and engagement on externally sourced ideas, employees who broker new ideas must be respected and sought out internally. Our research underscores how important it is for people in roles such as enterprise architects and senior IT leaders to have a dual focus. The implications for other roles are significant. Infrastructure designers, for example, tend to have more internal influence and less external connectivity. But to broker ideas from outside the company effectively, they need to have a better balance. Business analysts, by contrast, tend to be well connected externally but less sought out by their internal colleagues — an underexploited resource for promoting innovative new ideas.

4. Minimize Network Inefficiencies and Collaborative Costs

Decisions in IT organizations must address complex sets of interdependencies. What happens on one project often has implications for related applications, infrastructure choices, business processes and data models. As a result, IT employees tend to interact with a wide range of colleagues to make sure that potential solutions don't create new problems. However, such collaborations can be costly and even counterproductive if too many people are involved in meetings, e-mail chains and decisions.

Most of the CIOs we worked with were eager to find ways to reduce network connectivity at points where collaboration failed to produce sufficient value. In the IT organizations we studied, we typically found that just 3% to 5% of the most-connected people (often leaders and experts) accounted for 25% to 35% of the network ties. These employees were frequently overburdened, which slowed the work of the many people who interacted with them, albeit unintentionally. At Monsanto, for example, the 50 most-connected IT people consumed large amounts of their collaborators' time; in a typical week, their colleagues spent a total of 94 hours preparing for and interacting with each of them (more than three times the average for other employees). Reducing these collaborative demands involved several different approaches, depending on whether the individuals were top connectors based on their *organizational* role (that is, others sought them out for information, deci-

sions or resources by virtue of their formal position) or their *personal* attributes (others recognized them for their expertise, personality or trustworthiness).

Role-Based Factors Some individuals become central connectors because of their enterprise-level responsibilities, their interactions with a wide range of other IT units and the fact that they have a large number of direct reports. To reduce collaboration overload, we used network analysis to identify opportunities for rerouting access to the information they held, thereby pushing certain decisions to less overloaded points in networks and redefining their roles.

For one manager, the best solution was to insert a new set of managers between himself and his reports, thereby reducing his downward connectivity by 70%. Another manager saw that he had made himself indispensable to his team, which raised serious issues for succession. His response was to begin to disengage selectively from internal client meetings and to ask direct reports to fill in for him. Over time, clients began going directly to other people, which reduced the time he needed to spend while helping his associates build their own networks into other parts of the company. A third manager realized that he was simply being too helpful and that people were taking advantage of him. In response, he asked his executive assistant to challenge requests for meetings (to ensure that they were essential) and to offer less time than individuals requested.

Personal Factors Network overload can also occur when employees lean too heavily on colleagues for technical expertise or help in navigating the organization. To address such situations, it is important to identify the specific skill or expertise being sought and then cultivate a broader group of go-to people. For example, one technical expert was able to reduce his collaborative load by shifting nontechnical aspects of his work (such as planning and leading weekly meetings) to others. Although he still participated in the meetings, by eliminating the organizing responsibilities he gained several hours per week. Another manager saw the need to transition from being a technical expert to being a people connector; to enable this, he made a deliberate attempt not to respond to questions from internal clients. When queried about technical issues that he

knew a direct report could address, he pulled that person into the discussion, thereby signaling that the associate was fully capable of handling the problem: "When people saw that I was putting my trust in him, that really boosted his confidence and helped people across various groups see that he was a good guy to go to."

A third employee realized that a good way to eliminate overload was to document his projects thoroughly to ensure that he was not the sole expert: "We all love going on to the next technical challenge once the current one is up and running. That has low costs when you're wrapping up a project, but it guarantees that you become known as the go-to person, and that sticks with you. Forever."

Calculating the amount of time that a person's contacts invest in preparing and interacting with him or her makes it possible to identify the individuals who impose high collaborative costs on their network. For example, at Monsanto the employees who interacted with the least efficient project managers and organizational leaders spent five times more time preparing for and engaging in those collaborations than did employees who interacted with the most efficient project managers and organizational leads. (See "Improving Collaborative Efficiency.") This

IMPROVING COLLABORATIVE EFFICIENCY

Network analysis helped to identify which organizational leaders and project managers were more efficient collaborators and which were less efficient. Those in the top left-hand quadrant consumed a lot of their colleagues' time while supporting relatively few informational relationships. In contrast, those in the bottom right-hand quadrant provided a great deal of informational value very efficiently.
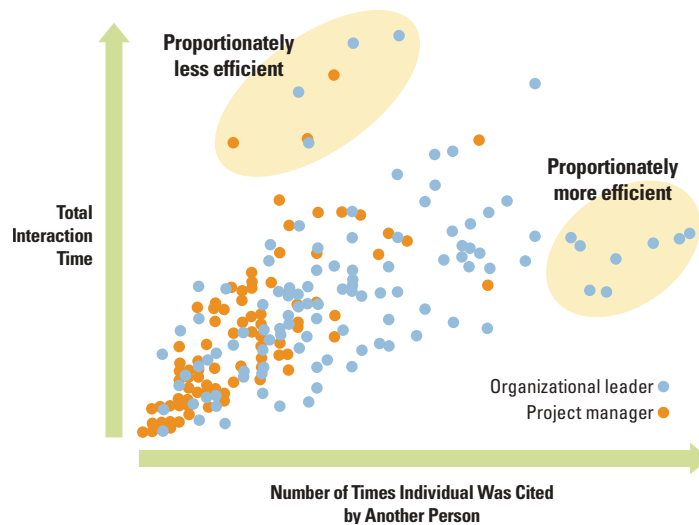
disparity motivated managers to look for best practices that could improve collaboration efficiency in specific roles. Among their findings: If the collaboration efficiency of only 20 of the less efficient project managers and organizational leaders improved from below-average to average, it would save the roughly 400 individuals who interacted regularly with those managers and leaders up to 1,500 hours per week.

Applying this kind of time-based analysis across all roles, we were struck by the sheer volume of the collaborative demands on people's time: Many individuals spent 25 to 35 hours per week preparing for and engaging in collaborations with others. These results confirm what many IT leaders suspect: Adding more people to a project may provide only marginal benefits, and it may actually slow things down.

Leaders can also obtain a variety of fine-grained, role-specific insights by understanding the amount of time that employees spend collaborating with others who share their role versus across different roles. For instance, we found that the least efficient quartile of programmers spent more than twice as much time collaborating with business analysts than did average programmers. That suggested the need to revisit expectations for how programmers interacted with business analysts — and opportunities for identifying and sharing the most effective practices throughout the organization. Managers who uncover such insights and embed them into training and mentoring efforts can save significant time and staffing costs.

EMPLOYEE NETWORKS CAN have profound impacts in transforming rigid organizations into flexible units that can adapt and innovate. But in making these changes, CIOs and other business leaders need to let go of some of their traditional management methods and embrace a different, more collaborative management model. Although organizational charts and standardized processes can provide important underpinnings, they are not flexible enough to support the types of internal and external collaborations and partnerships that companies need to maximize value. The best CIOs will promote patterns of collaborations that allow their organizations to become efficient, innovative and engaging work environments.

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REFERENCES

1. "Making the Difference: The 2008 CIO Agenda," survey, Gartner Executive Programs, January 2008.

2. R.L. Cross, R.D. Martin and L.M. Weiss, "Mapping the Value of Employee Collaboration," McKinsey Quarterly 3 (August 2006): 29-41; R. Cross, J. Liedtka and L. Weiss, "A Practical Guide to Social Networks," Harvard Business Review 83, no. 3 (March 2005): 124-132; and R. Cross and R.J. Thomas, "Driving Results Through Social Networks: How Top Organizations Leverage Networks for Performance and Growth" (San Francisco: Jossey-Bass, 2009).

3. "Creating Enterprise Leverage: The 2007 CIO Agenda," cited by B. Burton, in "Justifying Emerging Technologies to Business Leaders" (presentation at Gartner Symposium/ITxpo 2007, Sydney, Australia, November 20-23, 2007).

4. "The McKinsey Global Survey of Business Executives, July 2005," McKinsey Quarterly, July 2005, www.mckinseyquarterly.com/links/22581.

5. R. Cross, T. Laseter, A. Parker and G. Velasquez, "Using Social Network Analysis to Improve Communities of Practice," California Management Review 49, no. 1 (fall 2006): 32-60.

6. Interestingly, junior employees placed on virtual teams were sought out by their colleagues more frequently than senior employees who were not on a virtual team. Monsanto leadership came to see virtual team membership as an important on-boarding and development vehicle. With recent shifts in IT human resources management away from a recruiting-based "war for talent" and toward a retention-based model that must fast-track high performers and weed out low performers, anything that can effectively decrease time to productivity and help junior employees build and demonstrate their capabilities is likely to be valuable.

7. Energizing ties were based on employees' response to the question: How do interactions with this person *typically* affect your energy level? (Response could be positive, neutral or negative.) See R. Cross, W. Barker and A. Parker, "What Creates Energy in Organizations," MIT Sloan Management Review 44, no. 4 (summer 2003): 51-56.

8. A.B. Hargadon, "Firms as Knowledge Brokers: Lessons in Pursuing Continuous Innovation," California Management Review 40, no. 3 (spring 1998): 209-227.

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