

The McKinsey Quarterly

Mapping the value of employee collaboration

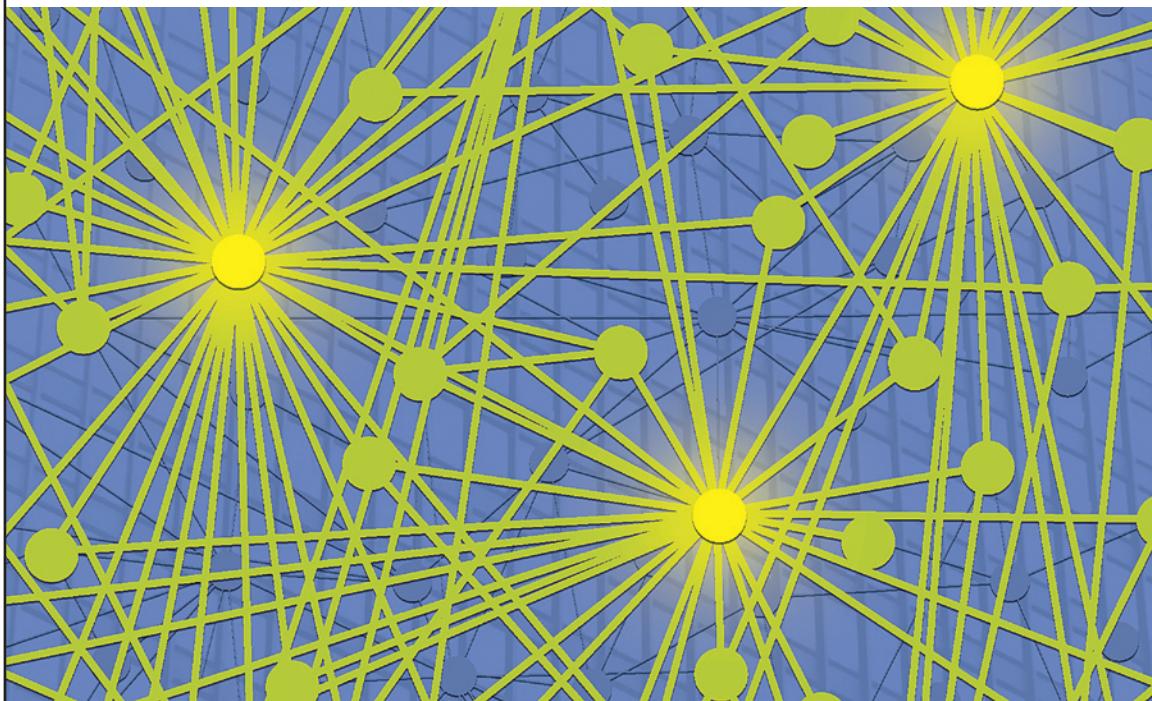
Article at a glance

Falling communications costs, globalization, and the increasing specialization of knowledge-based work are making collaboration within and among organizations increasingly important.

Yet few companies understand or know how to manage the intracompany networks in which collaboration typically occurs.

A few leading companies are beginning to map their networks of relationships, to analyze the economic costs and benefits that key interactions create, and to identify value-creating interventions.

Successful interventions help companies to reduce complexity, redefine roles, and allocate financial, physical, and human resources more efficiently.



Mapping the value of employee **collaboration**

As collaboration within and among organizations becomes increasingly important, companies must improve their management of the networks where it typically occurs.

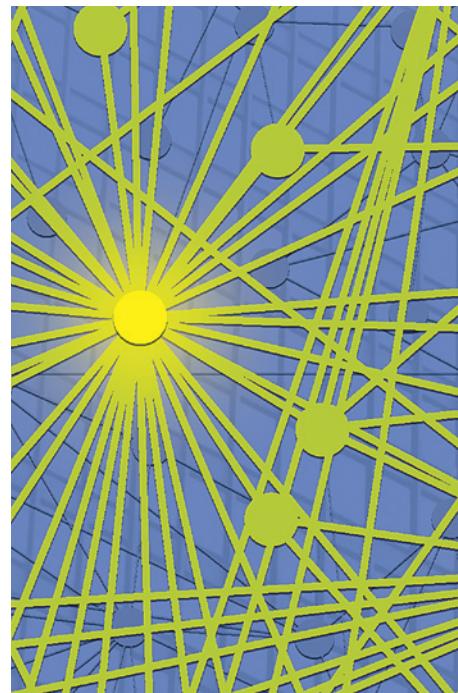
**Robert L. Cross, Roger D. Martin,
and Leigh M. Weiss**

Although collaboration is at the heart of modern business processes, most companies are still in the dark about how to manage it. Linear, process-based tools such as activity-based costing, business process reengineering, and total quality management have long been effective at measuring and improving the efficiency of people and organizations in accomplishing individual tasks. But they do a poor job of shedding light on the largely invisible networks that help employees get things done across functional, hierarchical, and business unit boundaries.¹

This blind spot has become problematic. Falling communications costs, globalization, and the increasing specialization of knowledge-based work have made collaboration within and among organizations more important than ever. As “tacit” interactions replace more routine economic activity and the scale and complexity of many corporations creep upward, the need to manage collaboration is growing.² Nearly 80 percent of the senior

¹This article focuses on intracompany interactions and collaborations rather than those extending beyond the boundaries of the enterprise. For more about the latter, see John Seely Brown and John Hagel III, “Creation nets: Getting the most from open innovation,” *The McKinsey Quarterly*, 2006 Number 2, pp. 40–51 (www.mckinseyquarterly.com/links/22578).

²For more on tacit interactions, which involve the exchange of information, the making of judgments, and a need to draw on multifaceted forms of knowledge in exchanges with coworkers, customers, and suppliers, see Scott C. Beardsley, Bradford C. Johnson, and James M. Manyika, “Competitive advantage from better interactions,” *The McKinsey Quarterly*, 2006 Number 2, pp. 52–63 (www.mckinseyquarterly.com/links/22579). For more on the evolution of large corporations, see Lowell L. Bryan and Michele Zanini, “Strategy in an era of global giants,” *The McKinsey Quarterly*, 2005 Number 4, pp. 46–59 (www.mckinseyquarterly.com/links/22580).



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executives surveyed in a 2005 study said that effective coordination across product, functional, and geographic lines was crucial for growth. Yet only 25 percent of the respondents described their organizations as “effective” at sharing knowledge across boundaries.³

Many companies have responded by spending heavily on collaboration software. In hopes of disseminating best practices and sharing expertise, a few leaders (such as BP, HP, IBM, P&G, and Xerox) have even begun identifying networks of employees doing similar work. Technology, though, at best fails to deal with the underlying problem

and at worst becomes a source of information overload that undermines effective collaboration. And it’s often unclear whether efforts to enhance networks promote productive collaboration or just consume money and time.

What companies need in a collaborative age is the ability to map and analyze the value created (or destroyed) deep within employee networks. Sophisticated network analysis approaches have emerged from the academic world during the past two decades. But they have tended to focus more on individual than organizational effectiveness and on communications, work flows, and the exchange of resources rather than on the value those interactions create.⁴ To make these tools more useful, executives must reorient them toward the revenue and productivity benefits that collaborative interactions generate, the costs such interactions impose, and opportunities to improve connectivity at the points that create the greatest economic value.

³For the full survey results, see “The McKinsey Global Survey of Business Executives, July 2005,” *The McKinsey Quarterly*, Web exclusive, July 2005 (www.mckinseyquarterly.com/links/22581).

⁴See Thomas J. Allen, *Managing the Flow of Technology*, Cambridge, MA: MIT Press, 1984; Ronald S. Burt, *Structural Holes: The Social Structure of Competition*, Cambridge, MA: Harvard University Press, 1995; David Krackhardt and Jeffrey R. Hanson, “Informal networks: The company behind the chart,” *Harvard Business Review*, July 1993, Volume 71, Number 4, pp. 104–11; Wayne E. Baker, *Achieving Success through Social Capital: Tapping Hidden Resources in Your Personal and Business Networks*, San Francisco: Jossey-Bass, 2000; and Rob Cross and Andrew Parker, *The Hidden Power of Social Networks: Understanding How Work Really Gets Done in Organizations*, Cambridge, MA: Harvard Business School Press, 2004.

Consider the experience of a leading biotechnology company that relied on sharing best practices among quality control engineers to help its manufacturing facilities rapidly ramp up the production of new products. Network analysis showed the company which engineers took part in the interactions that generated time savings and the greatest and lowest cost, respectively. Aggregated to reveal the economic value created through interactions across locations, these figures identified the places in the network where collaborative breakdowns inhibited the transfer of proven practices and showed how costly these breakdowns were. As a result, the company knew exactly where it made economic sense to invest in tools, training, and team-building efforts.

Organizations hoping to emulate the biotechnology company (and other pioneers in a wide range of sectors) must first map their collaborative networks and then analyze the economic benefits and costs that key interactions within those networks create. Once executives understand the value that's flowing across networks, they can intervene in straightforward, cost-justified ways. Typical examples include replicating high-performing networks, training workers to emulate the collaborative approaches of successful colleagues, making valuable expertise and advice more readily available, and revamping performance metrics to reflect mutual accountabilities better. These kinds of successful interventions can help companies reduce complexity, redefine roles, serve customers and clients more effectively, and allocate financial, physical, and human resources more efficiently.

Understanding how work really gets done

Three examples will show how traditional ways of mapping processes and analyzing activities have limits when it comes to understanding the performance of individuals, teams, and entire organizations.

- *Individual performance.* A nonprofit wanted to boost its fund-raisers' productivity. Conventional wisdom suggested targeting certain types of donors, managing the sales process in a defined sequence, and persuading donors through appeals tailored to their interests. Yet some high performers followed few of these practices; several low performers embraced them all.
- *Team performance.* A program to improve the processes of a large global construction company boosted the efficiency of its employees. But performance disparities remained across sales offices, even after controlling for the varying attractiveness of their markets.

- *Organization-wide performance.* An engineering company experienced growing pains as international expansion made it increasingly difficult to bring together construction managers and engineers, whose objectives were frequently in conflict. (The former focused on cutting costs, the latter on technical solutions.) Unfortunately, the company's linear view of the construction process—emphasizing the tasks performed by each group and the handoffs between them—shed little light on collaborative issues.

Network analysis can help companies in circumstances like these. The first step is identifying the functions or activities where connectivity seems most relevant and then mapping relationships within those priority areas. Options for obtaining the necessary information include tracking e-mail, observing employees, using existing data (such as time cards and project charge codes), and administering short (5- to 20-minute) questionnaires. Organizations mapping their decision-making processes might ask their employees, "Whom do you ask for advice before making an important decision?" Others targeting innovation might ask, "With whom are you most likely to discuss a new idea?" Questions are posed bidirectionally: if Joe says he was helpful to Jane, but she says she doesn't know him, his claim is disregarded. With the information in hand, companies can use standard software to create network maps illustrating relationships (Exhibit 1).

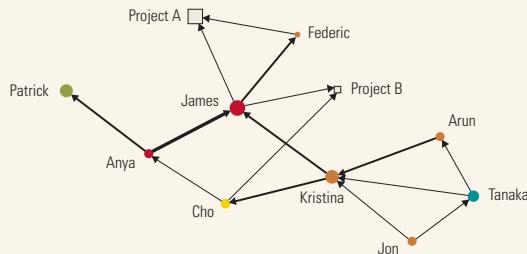
So far, so familiar. The real value comes when companies move from mapping interactions to quantifying the benefits and costs of collaboration. To do so, companies must assess the time employees spend on interactions of various types, as well as the savings and sales contributions of specific collaborations. Key inputs to this analysis include fully loaded compensation figures for network participants and detailed survey results (for example, the responses to queries such as, "How much time did working with employee X save you?" or "On how many deals in the following revenue bands did you work with employee Y?").

Network analysis helped the companies described earlier address their individual, team, and organization-wide performance issues. It turned out, for example, that high-performing fund-raisers not only had strong relationships with donors but also accounted for a disproportionate share (25 percent) of the connections *within* the fund-raising group. Tenure and experience were key reasons for the high performers' strong networks, so the organization was caught in a vicious cycle: low-tenure fund-raisers got stuck on the fringes of both their internal and external networks, became dissatisfied, and quit before they became productive. By helping

EXHIBIT I

Reading a network map

Selected elements of a sample network map



Node = individual or entity in network

Color Represents membership in or affiliation with group or category¹

Shape Represents different types of nodes (eg, one shape for individual, entity; another shape for projects, articles, laboratories)

Size Larger size represents greater degree of an assigned value—eg, degree of connectedness, centrality

Tie or link = connection between 2 nodes; represents an assigned value—eg, decision-making input, information transmission

Line weight

Thicker line indicates more frequent interactions

Arrow

Shows direction of interaction, eg, Kristina provides James with decision-making input

Spatial relationships

Location of nodes

Nodes with highest number of connections are located in center of map; those on periphery have fewest connections

¹ Group or category such as business unit, gender, geography, role, tenure.

new fund-raisers rapidly replicate the high performers' networks, the nonprofit expected to increase its revenue from employees with no more than two years' tenure by nearly 200 percent.

For the construction company, network analysis revealed that a key distinction between the strongly and poorly performing offices was the percentage of collaborative time (68 percent for the former, 50 percent for the latter) that account managers spent with customers. By getting at the roots of these issues—which further analysis attributed to hierarchy, organizational design, and project-management processes—the construction company replicated the network orientation of high-performing offices in poorly performing ones.

Finally, an analysis of one of the engineering company's high-performing groups showed that a small number of construction managers and engineers single-handedly accounted for 35 percent of all the collaboration occurring within it. This kind of collaboration dramatically enhanced the group's ability to deliver expertise. Identifying and building connectivity between specialists in other groups helped the firm to raise its construction revenue to \$275 million, from \$80 million, in a single year.

Creating relational value

The powerful results of identifying and replicating high-performing networks represent only a small part of the potential of network analysis.

>>> *Developing a network perspective can help the 21st-century organization retain the best of its traditional organizational structures, while simultaneously acknowledging the heightened value of innovations, collaborators, and intangible assets. See "The 21st-century organization" (www.mckinseyquarterly.com/links/22703).*

It's also possible to promote specific interactions that help generate revenue and boost productivity. Targeted action is dramatically more effective than promoting connectivity indiscriminately, which typically burdens already-overloaded employees and yields network diseconomies.

A more informed network perspective

helps companies to identify the few critical points where improved connectivity creates economic value by cutting through business unit and functional silos, physical distance, organizational hierarchies, and a scarcity of expertise.

Generating revenue

A network view often uncovers "hidden" people whose contribution to cross-selling or closing deals is far greater than individually focused performance metrics might imply. It can also suggest where to replicate collaborative behavior, when to draw in valuable experts from the network's fringe, and how to eliminate obstacles to collaborative sales efforts—obstacles that include time, skills, personalities, incentives, and ignorance of which colleagues have expertise. The experiences of a global technology company and a consulting firm illustrate how these issues play out in practice.

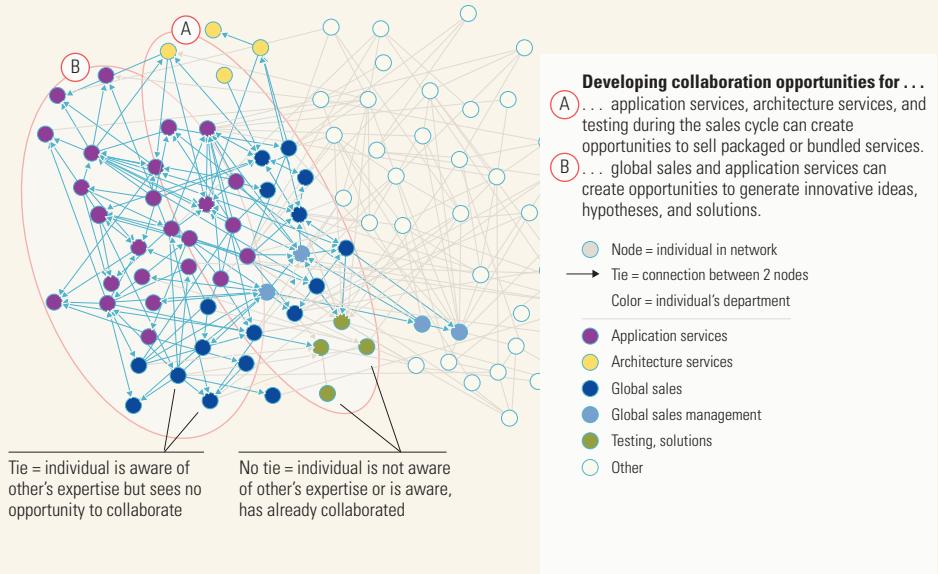
Improving cross-selling. A leading technology company used network analysis during an effort to become more responsive to customers and marketplace shifts. The analysis not only helped the company's leaders find out where collaboration generated revenue but also proved useful for reframing the roles of key players in the network.

The company, for example, broke out collaborative contributions by bands of revenue and learned that the most and least valuable interactions (those generating more than \$2,000,000 and less than \$250,000, respectively) invariably involved different people. What's more, a network perspective helped the company identify which colleagues knew about one other's expertise but didn't draw on it. (Exhibit 2 shows how many people said they were acquainted but saw no possibility of collaborating in a sales effort.) In our experience this very real but usually invisible barrier to cross-selling and account penetration is common in organizations.

EXHIBIT 2

A map of wasted opportunities

Individuals were asked to identify people whose expertise they knew about but with whom they saw no opportunity to collaborate. The resulting network map illustrates those *potential but missed opportunities*.



Source: Network Roundtable at the University of Virginia; McKinsey analysis

To boost sales the company sought both to replicate the major contributors' behavior and to help several key salespeople understand how collaboration could make them more successful. It quickly became clear that the success of the high-performing collaborators resulted from more than just expertise or affability. When the company compared them with its other salespeople, it found that they were accommodating, more responsive to requests, flexible, amenable to constructive criticism, enthusiastic team players, and effective conflict managers. The importance of these traits caused the company to overhaul its incentive program and to launch an effort to build collaborative skills throughout the sales network.

Enhancing career paths. When a global consulting firm used network tools to analyze the sales efforts of a group of roughly 80 partners, it identified two crucial categories of people who weren't recognized by its performance-management processes, which emphasized individual revenue production. By making joint sales calls, sharing experiences, and the like, 10 partners supported collaborative efforts yielding 60 percent of this group's revenue; the top 5 accounted for 38 percent. A completely different subset of partners made an enormous contribution to the execution of projects by helping others to save time and generate high-quality work; this second group, for

example, contributed expertise on the problems of clients, visited them, and helped with analyses. The contributions of these partners, too, were highly concentrated: the top 10 people were responsible for 48 percent of the value generated through time savings, and the top 5 for 32 percent.

The consulting firm used this knowledge to end a long-simmering disagreement about dual career paths for partners. There was no longer any question about the need to recognize the contributions of partners whose expertise or experience played a key role in winning many new clients and of those whose work improved the effectiveness and efficiency of the firm's efforts to serve them.

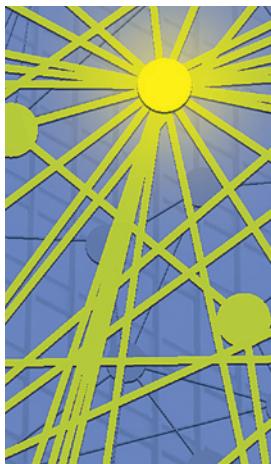
Boosting productivity

Most companies—even high-performing ones—can find opportunities to boost their collaborative productivity. Sometimes, network analysis shows them that they can generate savings by facilitating the transfer of advice and information from colleagues. In other cases, a network perspective isolates unseen collaborative inefficiencies resulting from poor job design, an ineffective allocation of the right to make decisions, and outdated role definitions, process steps, or organizational designs.

The specific issues and interventions vary considerably across industries. But some general themes emerge. Often, companies that operate without a network perspective allocate resources inefficiently, manage talent blindly, and experience large disparities in the effectiveness of collaboration within and across units. Scrutinizing the time savings that relationships generate helps companies to isolate what's working; to decide what, where, and how to invest in additional connectivity; and to redefine roles and staffing levels. Examples from three very different industries illustrate the range of possibilities.

Validating the effectiveness of networks, sharing good ideas. In the petrochemical business, avoiding downtime is critical given the magnitude of its investment in fixed assets. Solving problems quickly often requires collaboration across disciplines such as drilling, geology, physics, and production. So one leading petrochemical company formed more than 20 networks (ranging in size from 50 to several hundred employees) and focused on work areas where people could benefit from sharing best practices.

Having taken the unusual step of engineering these networks, the petrochemical company was particularly eager to measure their impact. Network analysis showed that the effort, which previously had been operating largely on faith, was generating substantial, shareable



productivity benefits. One 60-person network alone contributed \$5 million in savings. A typical story involves engineers and an out-of-commission oil well. Engineers used their network to identify an expert who had no relationship with the well but did have critical knowledge that helped them fix it in two days instead of the expected four. Network analysis thus allowed the company to validate the efficacy of its networks.

The company then began taking steps to pass lessons among networks. A knowledge-sharing team interviewed the leaders of networks to collect and disseminate best practices. Training sessions allowed

the leaders of the most successful networks to share what they had learned. The keys to success included forming networks carefully around focused topic areas closely related to the way work was actually done, giving network members the leadership and training for success (rather than merely dumping collaborative tools on them), and continually tracking and measuring success to encourage participation and inform decision making about when (and when not) to finance incremental network improvements.

Improving the allocation of resources. A global financial-services organization mapped and calculated the time its key employees saved by sharing information and resources with their colleagues. This effort helped the company to make better decisions about how much to invest in its collaborative relationships, whether to focus on collaboration within or across groups, and what role collaboration should play in its human-resources (HR) strategy. The success of a pilot effort led the company to replicate it widely, yielding savings that should ultimately dwarf the initial benefits.

Network analysis, for example, allowed executives to prioritize the company's investment in collaboration by helping them to model the financial benefits of improving the network and to weigh the anticipated returns against the costs. After recognizing that a set of key brokers occupied central positions in the network, for instance, the company realized that connecting all of these people with each other and with just one person on the network's fringe would yield \$140,000 a year in savings within business units and \$865,000 across them. Facilitating these interactions would be far less costly than buying the group another unused collaborative tool or holding an off-site meeting.

In addition, network analysis showed the company how to focus its collaborative efforts within and across groups, since aggregating results by

business units, roles, projects, and hierarchical levels showed executives where to direct the relevant investments. One division's global network of technical project managers generated monthly savings of 3,383 hours (which translated into roughly \$215,000). When the financial institution realized that about 70 percent of these savings resulted from collaboration within divisions, it began focusing more heavily on collaboration among them to reduce the number of redundant efforts and to promote the exchange of expertise in project-management tools, methodologies, and technologies.

Another benefit to the company was an improved ability to measure and manage talent. Executives were surprised to learn how much relational value was created by people they hadn't recognized as central contributors and how little by others they had regarded as more influential. The company responded by financially rewarding the key collaborators (many of whom had previously been frustrated by the failure to recognize their effectiveness), redefining roles and performance metrics to promote collaboration, and in some cases elevating (or demoting) the role of the network's central (or peripheral) figures in the company's succession plans.

EXHIBIT 3

Uncovering the value

Labor cost of time spent in or preparing for interactions with others (example of major US utility)

	Number of employees	Average cost of interaction time per employee per month, \$						
		Application architect	Business unit architect	Data architect	Infrastructure architect	Systems analyst	Project manager	Other
Application architect	17	2,126	1,121	715	1,597	476	626	1,103
Business unit architect	5	3,750	2,460	1,110	1,560	30	210	660
Data architect	6	3,600	950	2,800	2,225	225	975	650
Infrastructure architect	16	1,406	656	375	5,588	56	1,013	1,069
Systems analyst	2	1,125	0	150	975	0	1,500	1,275
Project manager	5	1,680	210	1,050	3,180	1,680	1,470	3,450
Other	7	1,714	471	193	1,843	364	1,971	2,057

Source: Network Roundtable at the University of Virginia; McKinsey analysis

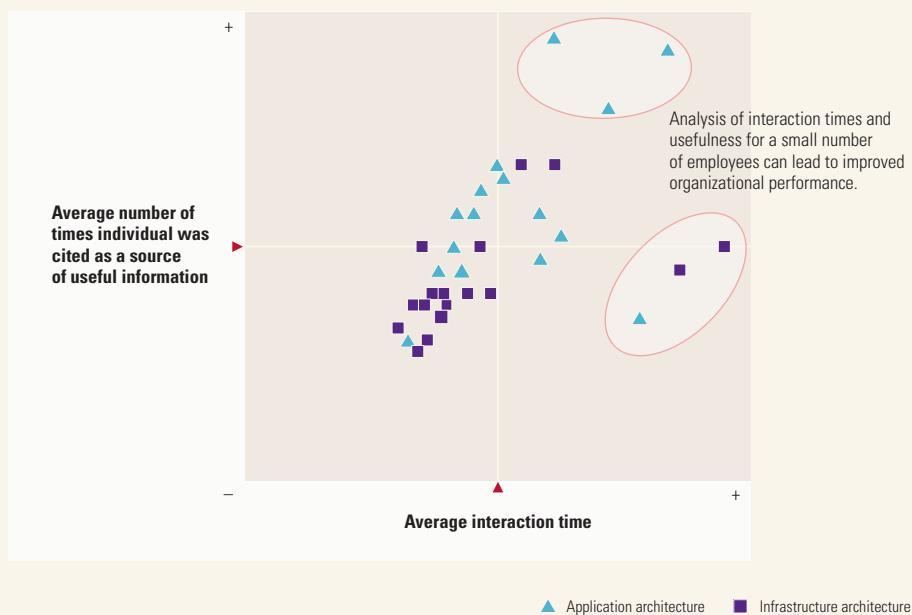
Managers were also encouraged to coach a few people who didn't know how to build networks.

Eliminating inefficiencies. The chief information officer (CIO) of a major utility calculated collaboration's average monthly cost per employee—both within roles (for example, collaboration among all data architects) and between them (between, say, data architects and other members of the IT staff)—throughout the IT organization (Exhibit 3). This analysis helped the company to root out collaborative inefficiencies. By comparing the colleagues who were generally considered effective communicators, for instance, the CIO was able to identify outliers: a small number of employees who actually were significantly less effective than the rest (Exhibit 4, on the next page). Consequently, the company focused personalized coaching efforts on collaborative issues that were unique to each of the unexpected low performers.

Network analysis also helped to clarify roles by showing that the utility's data architects and project managers spent more than half of their time collaborating. Yet these demands had never before influenced the hiring,

			Total monthly interaction labor cost, \$
Internal	External		
2,126	5,638	7,764	132,000
2,460	7,320	9,780	48,900
2,800	8,625	11,425	68,550
5,588	4,575	10,163	162,600
0	5,025	5,025	10,050
1,470	11,250	12,720	63,600
2,057	6,556	8,613	60,300

EXHIBIT 4

Who needs help?

Source: Network Roundtable at the University of Virginia; McKinsey analysis

staffing, or performance evaluations of such workers. As a result, they lacked collaborative skills, their job functions and role descriptions were incomplete, and the internal cost allocations used to establish transfer prices for IT projects underestimated the total cost of certain programs and thereby distorted the company's resource allocation. Addressing these issues not only improved the execution of projects and the company's ability to price them but also made internal customers more satisfied.

Finally, the company used network analysis to set appropriate staff levels. It knew that it could avoid certain problems by involving its infrastructure architects (who design and maintain major applications supporting vital business functions) in key decisions at the right time. But often this didn't happen. Traditional budgeting and cost allocation processes might have suggested hiring more infrastructure architects. Network analysis, however, showed that they interacted less than most other employees of the IT organization. The first step for the CIO, therefore, was breaking down the barriers that inhibited collaboration.

Collaboration is an increasingly vital feature of business life. But when companies just promote collaboration indiscriminately, they create bottlenecks and diminish their organizational effectiveness. A network perspective gives executives the information they need to foster collaboration at the points where it delivers an economic return. 

Rob Cross, an adviser to McKinsey, is an associate professor and director of the Network Roundtable at the University of Virginia's McIntire School of Commerce, where

Roger Martin is an assistant professor;

Leigh Weiss is an associate principal in McKinsey's Washington, DC, office.

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