

Who Knows Whom, And Who Knows What?

Employees' personal connections can be as valuable as their individual knowledge base. Social network analysis, or SNA, helps maximize a company's collective smarts.

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At first glance, it looked like your typical networking event. Three hundred research scientists from packaged-food giant Mars gathered in a Las Vegas ballroom last June, wearing name tags and working the floor. But instead of discussing the latest in M&M packaging or pet food nutrition, the scientists were roaming the room like a band of eager salespeople. Their RFID-enabled name tags lit up each time they met someone they didn't know, and their eyes widened as they watched diagrams of their social networks form on giant screens at one end of the ballroom. The diagrams expanded like giant molecules each time a manager spoke with a person new to him or her. To encourage the networking, Mars promised prizes to those with the most contacts or "points." The scientists—a largely introverted group from separate divisions in Los Angeles and New Jersey—were moving in a blur of handshakes, nods and cards changing hands.

Welcome to social networking for geeks. This particular exercise followed a yearlong study of social networks in Mars's sprawling research and development division. Top executives there wanted to improve the company's ability to innovate and were concerned that their scientists weren't networking enough with outside colleagues. To find out who was working with whom and how scientists were getting new ideas, they decided to map the group's professional contacts using a process called social network analysis (SNA). In an online survey, R&D managers were asked to name the 15 people they work most closely with and whom they go to for advice, as well as further details of their professional network. Working with Rob Cross, assistant professor of business at the University of Virginia and SNA expert, the company was able to map the network and examine data on how the scientists work—and don't work—together.

John Helferich, senior R&D vice president for Masterfoods USA, says Mars has used the SNA results to sort out relationships among key researchers. The company has determined, for instance, which scientists were overburdened (too many people were going to them for help) and is working on eliminating the need to go to senior people to get approval for things. "This speeds up innovation," Helferich says.

Companies that have been frustrated by traditional knowledge management efforts, such as Mars, are increasingly looking for ways to find out how knowledge flows through their organizations. Looking at the company org chart, it turns out, often doesn't tell the real story about who holds influence, who gives the best advice and how employees are sharing information critical for success. This all takes on greater urgency as millions of baby boomers prepare to retire over the coming decade. Social network analysis provides a clear picture of the ways that far-flung employees and divisions are working together, and can help companies identify key experts in the organization.

"SNA identifies the go-to experts and can help companies find the technical knowledge within their organization needed to develop a new drug, launch a new product and stay ahead of the competition," says David DeLong, author of *Lost Knowledge: Confronting the Threat of an Aging Workforce* and a researcher at MIT's AgeLab.

SNA isn't a replacement for traditional KM tools such as knowledge databases or portals, but it can provide companies with a starting point or blueprint for how best to proceed with KM initiatives. And SNA alone can't always provide crucial information about why people behave as they do, says Hal King, CEO of market research company King, Brown & Partners. "SNA as a KM tool is basically a monodimensional analysis that still needs to be supplemented by demographics, and most importantly, attitudes," says King. As a component to a larger KM strategy, however, SNA can help companies identify key leaders and then set up mechanisms—such as "communities of practice" or other groups—so that those leaders can pass on their knowledge to colleagues.

SNA Goes Corporate

Social network analysis got its start as a social theory developed by scientists in the 1930s who were exploring social patterns. One of those researchers, a New York City psychiatrist named Jacob Moreno, is often credited with inventing the "sociogram," a diagram of points and lines designed to illustrate relationships and social interactions among people. Scientists and mathematicians built on these ideas over several decades, investigating ways in which people get jobs, become leaders and develop friendships. They then mapped the flow of information through social networks. From the start, SNA has attracted philosophers, sociologists and statisticians looking to analyze human relationships in a mathematical and visual way.

According to Valdis Krebs, an SNA guru who worked with IBM and started his own SNA software company called Orgnet.com, SNA can be defined as "the mapping and measuring of relationships and flows between people, groups, organizations, computers, or other information- or knowledge-processing entities."

Over the past several years, with help from Krebs and other SNA believers, the corporate world has been waking up to the uses for this once arcane social science. Some of the interest stems from disappointment with efforts to build knowledge management databases that were largely ignored by employees. "We're seeing that companies want to have a picture of who the key knowledge brokers are in their organization," says Cross.

"The rise of blogs, online support sites and social networking sites—such as Friendster and LinkedIn—have also helped raise SNA's profile."

"So many communications are electronic these days that it has become much easier to record who is talking to whom," says Stanley Wasserman, professor of sociology, psychology and statistics at Indiana University and chief scientist for Visible Path, a software company devoted to analyzing social networks. "It's a natural thing to examine these networks and try to make sense of them."

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Companies interested in trying SNA can use software that falls into two basic categories: programs that track e-mail and other kinds of electronic communication, and programs that work from data collected via employee surveys. Such surveys typically ask employees to identify their top contacts within and outside the organization, as well as details about who provides good advice and how often they communicate. Companies may come up against some resistance from employees who may not want their networks mapped, but, as Mars was able to do, this resistance can be muted by promising confidentiality on the data supplied and by offering them versions of their "personal networks."

SNA can be a useful diagnostic tool in a wide variety of industries and professions, ranging from law firms to drug companies and financial

services companies. But the practice is relatively new in the corporate arena, and finding ROI can be a challenge. "We use it to find out how we are connected," says Vic Gulas, chief people and knowledge officer for environmental and construction consultancy MWH Global. "The challenge is to link actual [company] performance to SNA." Still, there may be strategic and targeted uses in which SNA can make a difference. For example, pharmaceutical companies are using it to help identify key scientists and discover how they are developing ideas for new drugs; government agencies are using the technique to pinpoint top performers who may be close to retirement in order to quickly devise methods to transfer that knowledge; and investment banks are using it to find better ways of serving clients and clinching deals. "Lost knowledge is an invisible problem, so companies don't always see the threat," DeLong says. "SNA makes it visible."

Finding the Gaps

SNA can also make the lack of connections (or collaboration) painfully clear. Two years ago, IT executives at MWH Global looked around at their sprawling, decentralized

company and knew they had to make some changes. Over the years, the Denver-based company had expanded through mergers to include 6,000 employees and 150 offices worldwide. Three separate IT organizations worked in different locations in groups dedicated to ERP, IT infrastructure and other large projects. The company decided to reorganize so that all 160 IT employees dedicated to servicing the company's internal IT needs reported to one location. The goal was to break down the silos and get people in Europe, Asia and the Americas talking to each other to improve service and create efficiencies.

But before this reorganization, Gulas, who spearheaded the IT centralization plan, decided to run an SNA to see how the groups were connected. The SNA was completed in September 2003, and the results, he says, clearly showed how the ERP group was cut off from the rest of IT, working in almost complete isolation. The analysis found that there was more collaboration between IT staff in Europe and Asia than within the 20-person ERP division. And because of this isolation, he says, there was little collaboration with users of the ERP software, and the ERP group got a reputation of being hard to work with. "People sometimes don't believe that they are disconnected from the rest of the organization, but in our case, a picture spoke a thousand words," Gulas says.

According to Cross, who helped Gulas map his social network with Web-based software, the technique can help companies such as MWH Global get a sense of who is best connected in the enterprise, as well as who is most overloaded. The results can be surprising. "People are finding disconnects across functional lines, physical distance and even between people working on key projects," says Cross, who is also coauthor of *The Hidden Power of Social Networks*. Some of these are to be expected, but others can cause real damage to an organization.

At Mars, the SNA project uncovered a lack of good communication between the snack food division in New Jersey and the food division in Los Angeles. "We found very few bridges between the two groups, and that lack of communication was leading to duplication of efforts in some areas," says Caroline Ruzicka, who was then group research and development manager for Masterfoods USA, a division of Mars, and has since left the company. Clear evidence of this lack of communication also spurred company efforts to fix the problem. Now, employees are expected to keep in touch with certain colleagues, and their performance reviews are based in part on successful networking.

Gulas has also taken steps to correct the problems highlighted by his SNA. Motivated in part by the disconnects it saw on the SNA diagrams, MWH has a plan to reorganize around functional groups instead of regional teams. For example, the company used to have people around the globe working on messaging technologies such as Lotus Domino. But these people were often working independently, with little knowledge of what their counterparts in other countries were doing. Now, there is a single manager overseeing the domain, directing the efforts on a worldwide basis.

In order to improve communication in the ERP group, MWH decided to break up the California-based team. The company was in the midst of upgrading the J.D. Edwards software and saw an opportunity to create cross-functional teams, combining people from ERP and other parts of IT, in order to break down barriers. Some of the ERP team members were assigned to the large upgrade project, which also included IT staff from other divisions.

A year after the first SNA, Gulas decided to complete another analysis to measure where progress had been made. The results showed that connectedness and communication improved in the IT group and that "more people knew who was doing what." What's more, the first SNA showed that average IT employees knew 29 people in the organization, while the second showed they knew 39.

As a result of the SNAs, Gulas has helped organize team-building sessions that brought people together from Europe and other parts of the organization who had never met before. He has used the SNA data to identify "strategic knowledge communities" in project management and client service management, which were largely unknown to senior staff. Gulas says his group is performing better after the SNA, and this improved collaboration has contributed to cost savings of about 8 percent. "It's an important tool to help us make sure that people are talking to each other," he says.

Danger: Disappearing Knowledge

If SNA is a good tool to use to find out whom people are going to for information, it can also help flag a potential problem if a lot of those "experts" are about to retire. That's a pressing problem given that, by 2010, more than half of all workers in the United States will be over 40—and that tens of millions of baby boomers turn 60 this year and will be contemplating retirement in the coming years. By mapping the social networks in their organizations, companies can find out ahead of time who has necessary knowledge and create ways of transferring it to younger employees before it's too late.

In one case, the central IT unit in the Canadian government, with a staff of 1,600, decided to do an SNA to establish which skills they should retain and develop. The IT group, which provides IT services to most of the Canadian government, made the move because they expected to lose 40 percent of senior managers to retirement within five years. Using SNA software from Knetmap, the agency was able to determine who had the most important knowledge and experience, and it was better equipped to start succession planning.

Even if succession planning isn't at the top of your agenda, data from an SNA can be used to help motivate your current staff. At Mars's Las Vegas meeting, the scientists were given a booklet mapping their own personal network as well as ideas on how to expand it. Later, they were encouraged to network outside the organization in order to increase possibilities for new ideas at the company. Now, networking has been built into the development and performance review process, and scientists have to set goals on expanding their networks.

Mars executives acknowledged that the data from SNAs can be sensitive, particularly when it comes to employee performance. Those who turn out to be highly connected are often high performers, and conversely, those with few connections often are not performing as well. "We looked at the outliers to figure out why they were isolated," Ruzicka says.

Initially, some of the scientists were reluctant to respond to the surveys. But because Mars officials were discreet with the results—Ruzicka and Helferich were the only ones who saw the results (about who was an outlier, for instance)—and because they didn't use the data in a punitive way, the scientists ended up embracing the project.

"When people got their own network profile, they came away energized to do more networking," Ruzicka says. "In the end, what we're doing is trying to retain people and increase innovation."

Peeling The Relationship Onion

Social network analysis can track e-mail and uncover relationships that don't always make it into centralized contact databases

Like most law firms, Orrick, Herrington & Sutcliffe is looking for ways to expand its client base at a time when many large companies are cutting back on their legal expenses. One way to do that, says the firm's CIO, Patrick Tisdale, is to encourage its 700 lawyers around the globe to share client contacts. "We have to assume that business is not going to fall in our laps," Tisdale says.

The problem, according to Tisdale, is that while attorneys are often glad to share information, they are unlikely to do so if it takes extra time and effort to plug the information into a database. In order to boost information-sharing efforts, San Francisco-based Orrick is trying out a type of social network analysis software that tracks whom employees are sending e-mails to. The software can reveal hidden relationships that don't always make it into traditional contact databases.

Tisdale says he is still evaluating the software from Visible Path, but that he can see the business value. The software allows the firm to harvest e-mail contacts into a database and analyze how attorneys are networking with clients. Attorneys can also use the software when they are looking for contact information for potential clients. For example, if an attorney is trying to get in touch with former GE CEO Jack Welch, he or she can plug that name into a search window, and the software will identify people in the firm

who have direct or secondhand relationships with Welch. (The names of these individuals are not known to the searcher; they are identified only by a code.) The searching attorney can then e-mail the anonymous person who appears to have the most direct relationship with Welch. Those who receive the e-mail have three choices: They can decline with anonymity; they can identify themselves and decline; or they can provide the contact information.

E-mail tracking, of course, doesn't take into account important face-to-face meetings. And some may not be willing to take the time to respond to queries from colleagues.

Even so, Tisdale says, "Law firms have to be more sophisticated now in analyzing the markets they want to participate in."