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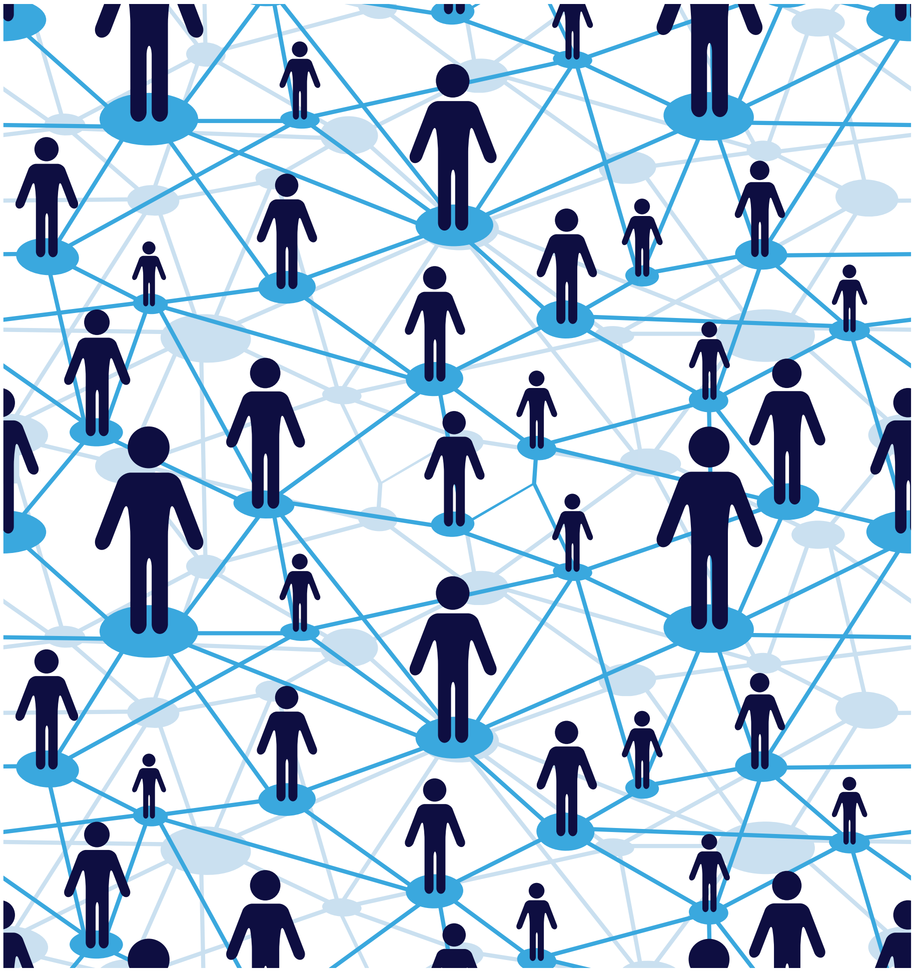


SWEET LANA/SHUTTERSTOCK

COLUMN

Better connected

Informal networks are key to idea-sharing, argue **Mark Fishman**, **Robert Cross** and **Brigitta Tadmor**.

Research-and-development companies are constantly changing their organizational structures to nurture innovation and increase productivity. Yet no single organizational model has emerged as the best option in either academia or industry.

Formal organizational structures are important, but scientific discovery is an emotional process shaped by social environment. In 2011, to improve understanding of interpersonal dynamics and to foster innovation, the pharmaceutical company Novartis, based in Basel, Switzerland, conducted a study of employee interactions in its global drug-discovery arm: the Novartis Institutes for Biomedical Research (NIBR). At the time of the study, the NIBR employed about 6,600 people at ten sites in the United States, Europe and Asia.

We wanted to understand how influential individuals ('key nodes') in the network affect information access, idea-sharing, problem-solving and other aspects of scientific discovery. We found that informal network structure — how people interact on a daily basis — differs dramatically from formal, hierarchical organizational structure. Key nodes in the informal network are better at sharing ideas and resolving difficulties than are formally appointed managers or leaders. Our data also suggest that improving how a person interacts with his or her informal network might have a greater impact on innovation than mandatory leadership courses and performance review. These findings may apply to many research-and-development organizations.

NETWORK ARCHITECTURE

To assess the NIBR's network of researchers, we sent out a questionnaire asking respondents to identify others in the organization with whom they needed to interact, whether in person, on the phone or by e-mail. Every interaction identified had to be crucial to the respondent's work. We asked respondents to assess the reasons for, and quality of, these interactions, and whether they needed more access to certain people, departments or areas of expertise. We then categorized the reasons for interactions: information access, problem-solving, idea-sharing, access to leaders and decision-makers, political support and personal support or advice. We categorized interactions as energizing or de-energizing; facilitating or hindering the discussion of new ideas and divergent points of view; providing a sense of purpose or urgency; and modelling leadership behaviours.

Finally, we collected demographic data on each person, including the length of their tenure at the NIBR, and their main language, gender and personality type according to a Myers–Briggs assessment. The overall participation rate was almost 70%, with about 70,000 reported connections (an average of 11 per employee).

Around 60% of all described interactions occurred within a department; the remaining 40% spanned scientific disciplines. Many scientists reported a need for greater access to other researchers or leaders, both within and across departments. It seems that network size depends on rank and tenure: the networks of the highest-ranking leaders (0.5% of the organization) tend to be almost ten times larger than those of people in entry-level positions, and it takes about three years from entering the ▶

organization for a person's network to reach average size. Researchers — particularly in Asia — interact less frequently with colleagues in different geographical areas or even in different buildings or floors of the same building. Other research organizations have reported[1] that interactions drop exponentially beyond distances greater than 15 metres.

Finally, we observed subtle network preferences based on culture, language and gender. For example, scientists in Shanghai, China, have smaller networks than those in the United States or Europe but spend twice as much time in each interaction. This supports the idea that relationship-building is an important part of the culture of Asian firms. We also observed that scientists who speak the dominant language at a site have larger networks than scientists who use the minority language; furthermore, men have larger networks than women, preferentially interact with other men and tend not to consider women as leadership role models. These findings are consistent with the sociological concept that people favour members of their own 'group' over others.

KEY NODES

Overall, we found that scientists who have positive interactions with others have larger networks than would be predicted from their formal position in the hierarchy (and vice versa). Those who can instil a sense of purpose and inspire others are pursued by their network for idea-sharing, information access, problem solving and personal support. We teased out three distinct categories of scientists who act as key nodes in their networks:

Experts These scientists offer expertise in certain technical, scientific or clinical areas across the NIBR. There are experts at all levels and across all functions in the organization; some offer their expertise locally (within a subunit of a department) whereas others are more widely connected, providing expertise across geographies and disciplines. As individuals, they tend to be analytical and introverted.

Mentors These scientists provide others with a sense of purpose, and their colleagues feel comfortable approaching them with new ideas and divergent points of view. As a result, mentors are sought for help with problem-solving and for personal support and advice (see 'Network nodes'). They exist at all levels in the organization but their positive interactions make their networks 50% larger than the average among their peers. No single personality type is dominant among these individuals.

Brokers These scientists have large networks and are connected broadly across functions and geographies. They tend to be high ranking and visible in the organization, and they mainly provide political support and access to decision-makers. They are not sought primarily for idea-sharing, problem-solving or scientific expertise. They tend to have extroverted and assertive personalities.

The effect of key nodes on the organization is powerful. As reported in previous studies, one important distinction is whether a person energizes or de-energizes people in his or her network[2]. We found that people who can get colleagues motivated also energize their networks. Furthermore, energizers create an environment that fosters collaborations and encourages joint problem-solving and idea-sharing. De-energizers, by contrast, create an environment in which people are reluctant to collaborate and share ideas, and in which interactions are perceived as demotivating. Mentor nodes are invariably energizing, whereas expert and broker nodes can have either effect. Both positive and negative effects are more pronounced when people have large networks.

THE IMPLICATIONS

How did we make use of the data that we gathered? The NIBR study was done anonymously to enable a high rate of response, which hindered any direct, open intervention with specific individuals. But we did take some action. First, we shared the study's general themes and observations with the organization, highlighting the level and quality of interactions in each department and between departments, and identifying areas that lacked intra- or interdepartmental collaboration. This gave leaders an opportunity to address these issues.

Second, using a confidential website, we provided each person with information about how they were perceived by the network. We offered individual coaching and workshops for small groups or teams, including workshops on personality styles and subconscious biases, and how these factors affect interactions with others.

> ***"Those who can instil a sense of purpose and inspire others are pursued by their network for idea-sharing and problem-solving."***

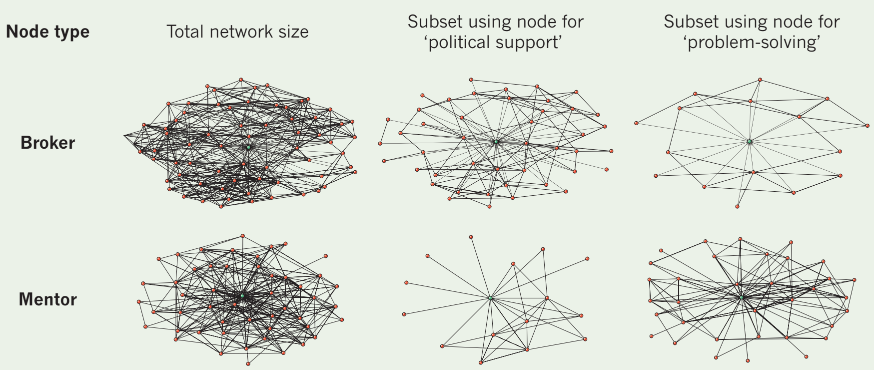
More than 60% of all people at the NIBR accessed their personalized, web-based network information, including people who didn't respond to the survey but were named in other people's networks. More than 10% (about 700 people) voluntarily engaged in follow-on activities (among high-ranking leaders, that figure was 25%), including those with smaller than expected or poor-quality networks.

We believe that helping a relatively small group of self-motivated scientists to improve their interactions — by becoming easier to approach with new ideas, for example — will create an innovative culture much more effectively than making formal changes in the organizational structure or mandating training for managers or leaders. And other network research suggests the same[3].

Information networks are often not considered in traditional performance evaluation at science organizations, in which line managers make assessments with little input from others. We believe that such omissions fail to provide incentives for open collaboration. Our mapping of interactions at the NIBR suggests that, whatever the field of science, feedback from the informal network, coupled with individual and small-group coaching, will facilitate a creative, innovative culture. ■

NETWORK NODES

Brokers and mentors (green) both work closely with lots of people (red), but whereas brokers are mainly sought out for political support, mentors are in demand for problem-solving.



SOURCE: NIBR

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