

BETTING ON PEOPLE POWER: BY USING TECHNOLOGY TO FACILITATE IDEA EXCHANGE IN THE WORKPLACE, ORGANIZATIONS CAN RAISE THEIR COLLECTIVE SMARTS

Alex “Sandy” Pentland

Let’s say your company is in trouble—new competitors are coming on strong, and it’s your job to assemble a crack team to act fast, solve problems and secure the firm’s future. What qualities would you look for? Would you try to pick the people with the most experience? The strongest résumés? The highest IQs? These traits are important, but your best bet might be to observe your candidates at a cocktail party. In that setting, you could quickly get a sense of how well they and new ideas, make allies and discover potential conflicts.

These abilities are fundamental for building human enterprises that are creative and agile. Our social brain—which gives rise to our capacity to manage people, interactions and relationships—is the most powerful component of human intelligence. Indeed, the so called social brain hypothesis holds that humans have a relatively large brain, compared with other vertebrates, mainly because of our need to keep track of all this social information. To date, though, our society has not developed many useful applications to support our social brain. Facebook, LinkedIn and other networking sites are mostly gossip machines, opinion echo chambers or CV catalogs. In many ways, they are run more for the benefit of their owners than their users.

But imagine if we could create tools and information feeds to reveal what is really going on inside companies, cities and governments—not just with our “likes” and friends. To accomplish this feat, we would need systems that support our social brain’s talents for reading other people’s behavior and fine-tuning relationships, just as today’s computer tools extend our memories and computational skills. By teaching computers more about how humans interact best, the hope is that they can play the role of social secretaries and facilitate genuine social connections.

RE-TOOLING THE ORGANIZATIONAL BRAIN

To understand how this might work, think of an organization as a kind of brain, with the employees or members as the individual neurons. Static firms—symbolized by the ubiquitous “org chart”—have fixed connections and, as a result, a limited ability to learn. Typically their departments become “siloes,” with little communication between them; the flow of fresh, cross-cutting ideas is blocked. In that state, firms risk falling to newer, less ossified competitors. But if we could supercharge an organization’s social skills,

The connections—among employees, departments and team might continuously reorganize themselves in response to shifting circumstances and challenges. Of interest, this idea of adaptable connections is exactly the insight powering today’s cutting-edge artificial intelligence, including both statistical-machine-learning and deep-learning-neural-network approaches. In these models, the connections between simple logic machines are reconfigured as the system learns. In contrast to logic machines, people can remake not just their connectivity but also their function, offering a fluid architecture that is qualitatively more powerful. Armed with the right feedback, human “smart neurons” in an organizational brain can fill communication gaps to accelerate learning, anticipate “unknown unknowns” and invent new structures to address emerging market forces.

INSTEAD OF FOCUSING ON MACHINES THAT MIGHT REPLACE EMPLOYEES, AS MOST AI APPLICATIONS STRIVE TO DO, WE ARE INTERESTED IN DEVELOPING MACHINES AND TOOLS TO MAKE PEOPLE MORE SOCIALLY AWARE AND EFFECTIVE.

IN THIS RESEARCH BRIEF

- To boost innovation, we need systems that support our social brain’s talents for reading other people’s behavior and fine-tuning relationships, just as today’s computer tools extend our memories and computational skills.
- High-performing teams show a specific pattern of communication one in which all members contribute more or less equally. The MIT research team is developing apps to help co-workers optimize their communication patterns and work smarter together.
- Developing the best strategy in any scenario calls for striking a balance between engaging with familiar practices and people and seeking out fresh ideas.



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My research group at the Massachusetts Institute of Technology is using technology to help organizations tap into and capitalize on this kind of people power. Instead of focusing on machines that might replace employees, as most AI applications strive to do, we are interested in developing machines and tools to make people more socially aware and effective. In the laboratory and in real life, we have found that these aids can help co-workers communicate better, find greater success and enjoy work more.

GO WITH THE FLOW

To optimize a company’s social brain, you need to first understand how ideas flow through it and ultimately take flight. But how do you track this invisible current as it passes from one person to the next? In the early 1990s my students and I at the M.I.T. Media Lab helped to pioneer the idea of wearable computing. Our work paved the way for Google Glass and similar products. From the start, though, we were also keenly interested in developing what we call collaboration wearables, sensors capable of measuring and providing feedback on social interactions, not just on individual behavior.

During the past two decades we have designed several generations of instruments in various forms—from credit-card-size name badges and wristwatch-style devices to cradles that also keep smartphones charged. The devices keep track of how often colleagues listen to, interrupt or speak with one another. They do not record what people actually say—privacy concerns trump all else. But the data they do collect, combined with e-mail and phone records, reveal a pattern of idea exchange through time and space—creating what is, in essence, a snapshot of an organization’s “social physics,” to borrow a term from Auguste Comte, a founder of sociology.

Using these wearable devices, my colleagues and I looked for patterns of behavior that were associated with high performance. We ran a series of experiments in 2010 in which we administered standard IQ tests and other measures to nearly 700 people divided them into teams of two to five members and then gave them a variety of problems to solve.

CRITICALLY, WE FIND THAT RICH CHANNELS OF COMMUNICATION— IDEALLY FACE-TO-FACE INTERACTIONS BUT ALSO VIDEOCONFERENCES AMONG SMALL NUMBERS OF PEOPLE—TEND TO BE VITAL FOR IDEAS TO GAIN MOMENTUM.

Somewhat surprisingly, we found that a group’s success at meeting these challenges was only weakly related to the IQs of its individual members. So, too, we found little correlation with the group’s cohesion or levels of motivation and satisfaction—as measured with standardized questionnaires. Instead the most successful teams were those that were able to optimize communication within the group. If every team member was engaged and making many contributions, then the group was very likely to be successful. This also meant that members of racial and cultural minority groups, whose ideas and experience may be different from the majority, had the opportunity to contribute and be heard.

In a follow-up study in 2014, we were able to show that the same strong pattern of exchanges that give rise to successful teams also produce what retired U.S. Army General Stanley A. McChrystal described as a “team of teams.” McChrystal used this concept of meta teams—groups that assemble collaborators from different parts of a company—to help decentralize decision making when he took command of the Joint Special Operations Task Force during the Iraq War. Our findings indicated that people who are especially adept at forging and maintaining connections across an organization are critical for opening up channels for ideas to spread. These cross-team ties help to break down silos and increase the organizations’ productivity and ability to innovate.

SEEING IS BELIEVING

As part of our research at M.I.T., we have deployed collaboration wearables in more than two dozen different work environments: among creative and research staffs, at consulting firms, and in banks, pharmaceutical companies, military installations, call centers and postoperative hospital wards, to name just a few. These real-world analyses have demonstrated just how powerful the relation is between a company’s performance and its pattern of communication—not the actual content of that communication but how it spreads.

Critically, we find that rich channels of communication—ideally face-to-face interactions but also videoconferences among small numbers of people—tend to be vital for ideas to gain momentum. This finding is perhaps not so hard to explain. Unlike e-mail and other forms of electronic communication, face-to-face dialogue is imbued with all kinds of nonverbal cues. I refer to them as honest signals because they convey the truth about people’s thoughts and intentions, regardless of what they actually

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express in words. These cues tell us when someone is bluffing, interested in our ideas or not really paying attention at all. And it is on this nonverbal level of interaction that people can intuit where they stand in a group’s hierarchy and get a sense for how decisions are unfolding.

One of our case studies highlighted just how well face-to-face interactions can grease the wheels of progress. In 2009 we used collaboration wearables to assess why operators at an American bank’s call center handled calls at wildly different speeds—despite the fact that their workdays were largely scripted and fairly uniform. We found that among several different teams, those who, on average, handled calls the fastest were also those who talked to the most other operators. Managers at the call center had scheduled individual coffee breaks to try to cut down on such socializing. But when we prescribed team-wide coffee breaks to encourage the operators to share more ideas—not just about work but life in general—the lagging teams rapidly caught up. Profits rose by \$15 million when the bank’s bosses implemented our advice at all call centers.

An earlier case study showed how teams also win when they meet face-to-face with colleagues outside their own groups. In 2007 we assessed the communication patterns among five departments within a German bank, collecting data from e-mail records and name-badge-style wearables. (See sidebar, pg. 4) We noted that nearly all communication with members of the customer service department was via e-mail. Almost no one spoke to them in person, whereas the other four departments interacted frequently in hallways and around coffee machines. The problem was simply that customer service was in another part of the building. When bank management saw our analysis, they moved the department nearer to everyone else. Greater proximity meant more input from these employees. As a result, several new ad campaigns took off where previous initiatives had failed.

FOLLOW THE BOUNCING BALL

More recently, we have been finding that we can optimize the flow of ideas during face-to-face conversations using real time visual feedback. For instance, we have developed an application for small groups, now being commercialized by Google, in which a floating ball displayed on a screen represents the conversational tide. The position of the ball shows who is dominating the conversation around a conference table at any one time. In tests, we find that this tool encourages more people to join in at meetings—shaping the pattern of communication so as to maximize collective

This kind of feedback is especially valuable for people participating in a meeting remotely, for whom it can be harder to track the social dynamics in the room.

THE SECRET TO CREATING AN AGILE, ROBUST ORGANIZATION IS CLOSING THE LOOP BETWEEN WORKERS AND BOSSES SO THAT EMPLOYEES ARE BOTH HELPING TO CREATE CORPORATE PLANS AND EXECUTING THEM.

Such real-time feedback can dramatically improve digital learning. By some estimates, 30 to 45 percent of all workers in the U.S. do their jobs remotely at least part of the time, and distance learning is one of the fastest-growing segments of corporate training. We have designed a system that, in addition to standard video lectures, offers e-learners access to smaller break-out groups of three to have people who can engage in a video-conference and see a floating-ball visualization of the communication pattern among them. When these breakout groups optimize their discussions so that everyone contributes more or less equally, all the participants benefit from the kind of peer-to-peer learning that happens naturally in person.

Even on-site workers have a limited capacity to know what else is happening in the company. To remedy this problem, we are testing so-called deep-learning algorithms to prioritize what might be productive new connections within a larger organization. For instance, these algorithms might sort through gigabytes of business-process data to connect people with similar responsibilities in different divisions. Such algorithms might also ping us when existing connections would benefit from more urgent coordination. And computers could also compare actual patterns of human-to-human communication with best practices, checking for communication gaps between departments that should be working together more closely.

These kinds of workplace tools might also help fill in for some missed watercooler chats by keeping track of useful skill sets. For instance, an app might give suggestions such as: “Most people working in this design group are also familiar with the production process. Perhaps you would like to look over the production process plan before you begin?” It might also offer process suggestions such as: “People from your group almost never set the permissions for this file to be publicly shared. Are you sure you want to do this?”

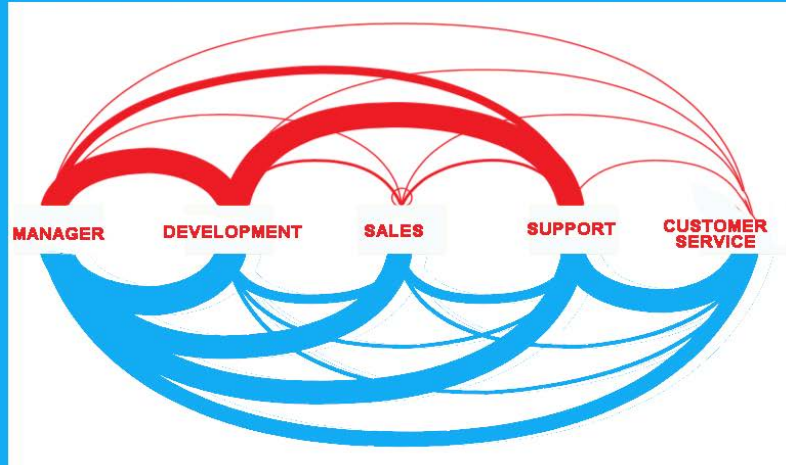
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CASE STUDY

TECHNOLOGY CAN STRENGTHEN TEAMWORK

The MIT research team assessed communication patterns at a bank in Germany by examining e-mail records and using small collaboration sensors. The badge-like sensors tracked patterns of verbal communication between employees—namely, how and where they spoke but not what they said. The data the researchers collected revealed a problem that was stymieing efforts to attract new business. Although most departments had a healthy mix of digital communication (blue lines) and in-person dialogue (red lines), often conducted around coffee stations and in hallways, almost all conversation with the customer service department was confined to e-mail. That department happened to be housed in a distant part of the building. When the bank moved customer service closer to the other teams, its overall input increased, which led to more successful advertising campaigns.



These process suggestions are becoming increasingly important as companies realize that more and more cyberattacks are successful because people inadvertently fail to follow standard procedures.

Actively encouraging greater engagement among team members offers yet another mission-critical benefit: when everyone participates and shares ideas, individuals feel more positive about belonging to a team, and they develop greater trust in their colleagues. These feelings are essential for building organizational resilience. Social psychology has documented the incredible power of group identities to bond people and shape their behavior, and the same holds true in the office: group membership provides the social capital needed to see employees through inevitable conflicts and difficult periods.

WISDOM OF CROWDS

Some of these tools might sound a little too close to Big Brother micromanagement for comfort. But if everyone gets a voice in creating and modifying the suggestions they offer, then they become a cooperative effort—which is exactly how our social brain generates collective intelligence, something that is often greater than the sum of its parts. A big discovery my colleagues and I have made, now in hundreds of case studies, is that we can consistently improve on the decisions of top bosses or leadership committees by incorporating the opinions of employees who actually have skin in the game.

For instance, call-center workers often have better ideas about how to meet customer demand than the people who do financial planning, and production engineers know more about how a new product is shaping up than its designers do. The secret to creating an agile, robust organization is closing the loop between workers and bosses so that employees are both helping to create corporate plans and executing them. This circulation fits with another key finding: developing the best strategy in any scenario involves striking a balance between engaging with familiar practices and exploring fresh ideas.

To investigate how people maximize the wisdom of a crowd, we worked with eToro, a social-network stock-trading site where people can see what trades other people choose, discuss them and copy them. In 2012 we analyzed some 5.8 million transactions and found that the traders who fared best maintained the most diverse networks. Up to a certain point, they made better forecasts as they combined insights from more people using different strategies. But when they started adding people with approaches that were only slightly different from their own, their forecasts declined. We calculated that the forecasts from “Goldilocks” groups—those with eight to 10 very diverse people and their strategies—reliably beat the best individual forecasts by a margin of almost 30 percent. Furthermore, when we showed traders with the least diverse social networks how to optimize their reach, they doubled their return on investment.

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Given the increasing pace of technological disruption and international competition, organizations ranging from small family businesses to giant government bureaucracies face increased pressure to raise productivity and accelerate innovation. This pressure has serious ramifications for many workers, whose skills are becoming obsolete and whose jobs are disappearing. But I believe that we can reduce this disruption and pain by focusing on technology that complements the unique social abilities of humans rather than focusing on technology that replaces people.

By tracking the flow of ideas among colleagues, we are finding ample new support for an old notion: innovation happens when you bring diverse people together to bounce ideas off one another. Companies that bet on enhancing their social brain will be better at interacting with customers and planning for the future. By using wearables and computers to keep track of how well communication patterns match business processes, companies can achieve both greater agility and higher performance while still being people-centered and humane.

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