In Silicon Valley the tight correlation between personal interactions, performance, and innovation is an article of faith, and innovators are building cathedrals reflecting this. Google’s new campus is designed to maximize chance encounters.

Facebook will soon put several thousand of its employees into a single mile-long room. Yahoo notoriously revoked mobile work privileges because, as the chief of human resources explained, “some of the best decisions and insights come from hallway and cafeteria discussions.” And Samsung recently unveiled plans for a new U.S. headquarters, designed in stark contrast to its traditionally hierarchical culture. Vast outdoor areas sandwiched between floors will lure workers into public spaces, where Samsung’s executives hope that engineers and salespeople will actually mingle. “The most creative ideas aren’t going to come while sitting in front of your monitor,” says Scott Birnbaum, a vice president of Samsung Semiconductor. The new building “is really designed to spark not just collaboration but that innovation you see when people collide.”

Faith is nice, but do executives have proof that this works? Social space like Samsung’s could be just another in a long line of fads and broken promises in workspace design: The “action office” becomes the cubicle. Cubicles are torn down for open plans, which leave introverts...
Outdoor and large public spaces are sandwiched between floors.

Public areas can become semipublic meeting places.

Silo-busting requires spaces that draw people out of their offices.

How do we know whether any of these approaches is effective? The key metric companies use to measure space—cost per square foot—is focused on efficiency. Few companies measure whether a space’s design helps or hurts performance, but they should. They have the means. The same sensors, activity trackers, smartphones, and social networks that they eagerly foist on customers to reveal their habits and behavior can be turned inward, on employees in their work environments, to learn whether it’s true that getting engineers and salespeople talking actually works.

Emerging Evidence

We’ve already begun to collect this kind of performance data using a variety of tools, from simple network analytics to sociometric badges that capture interaction, communication, and location information. After deploying thousands of badges in workplaces ranging from pharmaceuticals, finance, and software companies to hospitals, we’ve begun to unlock the secrets of good office design in terms of density, proximity of people, and social nature. We’ve learned, for example, that face-to-face interactions are by far the most important activity in an office. Birnbaum is on to...
Coworking spaces are a response to the oppressiveness of the cubicle and the loneliness of the telecommuter. Young digital workers believe that these spaces improve their performance.

Chance encounters and interactions between knowledge workers improve performance.

We’ve also learned that spaces can even be designed to produce specific performance outcomes—productivity in one space, say, and increased innovation in another, or both in the same space but at different times. By combining the emerging data with organizational metrics such as total sales or number of new-product launches, we can demonstrate a workspace’s effect on the bottom line and then engineer the space to improve it. This will lead to profound changes in how we build our future workspaces. Here are a few:

**Recognize office space as not just an amortized asset but a strategic tool for growth.**

The consulting and design firm Strategy Plus estimates that office utilization *peaks* at 42% on any given day. By that logic, the best way to manage cost per square foot is to remove “wasted” square feet. But the data we’re generating reveal that investments in re-
The park mixes spaces for work, living, and play, encouraging serendipitous meet-ups.

Engineering space for interactions over efficiency can increase sales or new-product launches.

**Design offices to reflect how 21st-century digital work actually happens.**

The buildings we go to every day haven’t changed as much as have the tools we use to get work done. Merging digital communication patterns with physical space can increase the probability of interactions that lead to innovation and productivity.

**Re-engineer offices to weave a building, a collection of buildings, or a variety of workspaces into the urban fabric.**

The office of the future will most likely include highly networked, shared, multipurpose spaces that redefine boundaries between companies and improve everyone’s performance.

Getting there won’t be easy. It will require collecting much more data to inform new design and management principles while engaging urban planners and municipal governments. It will also transform HR, IT, and facilities management from support functions to facilitators. But if companies can change their spaces to reflect how people work, performance improvement will follow. Don’t take that on faith. There are data to prove it.

**Strategic Coffee Machines**

Jon Fredrik Baksaas, the CEO of the Norwegian telecommunications company Telenor, credits the design of the company’s Oslo headquarters with helping it shift from a state-run monopoly to a competitive multinational carrier with 150 million subscribers. That design, he says, improved communication, accelerated decision making, and even created what he calls “an attacking mindset.” It was ahead of its time in 2003, when it incorporated “hot desking” (no assigned seats) and
spaces that could easily be reconfigured for different tasks and evolving teams.

Telenor’s CEO thinks of its headquarters not as real estate but as a communication tool.

The design features that make the space effective resulted from a profound shift in mind-set: Baksaas thinks of the offices not as real estate but as a communication tool. Thus strategy, features, and value become more important than cost and efficiency. You’d choose the e-mail provider with the best collaboration and file-transfer features; you can think of space investments the same way.

The improved communication Telenor achieved in its new space can be explained by Alex “Sandy” Pentland’s April 2012 HBR article, “The New Science of Building Great Teams.” Pentland deployed badges (the same kind now used by Ben Waber’s firm) that track how people talk to one another, who talks with whom, how people move around the office, and where they spend time. (Devices were worn on an opt-in basis, and individual data were anonymous and unavailable to employers.) Pentland identified three key elements of successful communication: exploration (interacting with people in many other social groups), engagement (interacting with people within your social group, in reasonably equal doses), and energy (interacting with more people overall).

Spaces designed to promote these activities increase the likelihood of collisions—and the data repeatedly demonstrate that more collisions create positive outcomes. We don’t measure the content of interactions, but that doesn’t matter. When collisions occur, regardless of their content, improvement typically follows.

Spaces can be designed to favor exploration or engagement or energy to achieve certain outcomes. For example, if a call center wants improved productivity, the space should favor engagement—getting the team to interact more. Higher engagement is typically accomplished not with open social space but with tight, walled-off workstations and adjacent spaces for small-group collaboration and interaction. The team’s break area becomes a crucial collision space. At one call center, the company expanded the break room and gave reps more time to hang out there with colleagues. Paradoxically, productivity shot up after the change. Away from their phones, the reps could circulate knowledge within the group.

Then again, for a company that—like Telenor—is
trying to innovate or change, increasing engagement can be detrimental, because it takes time away from crucial exploration with other groups and outsiders. Telenor’s open, public, and flexible space values exploration much more than engagement—it begs employees to meet in the open, where they may bump into unexpected people, and allows them to claim spaces and shape them for brainstorming sessions.

Once a company has identified the pattern it’s trying to achieve and how the pattern affects outcomes, it can begin to calculate the value of workspaces, not just their costs. For example, we deployed sociometric badges with about 50 executives at a pharmaceuticals company who were responsible for nearly $1 billion in annual sales. They wanted to increase sales but didn’t know what behaviors would help. Even if sales went up, they couldn’t necessarily say why.

The data collected over some weeks showed that when a salesperson increased interactions with coworkers on other teams—that is, increased exploration—by 10%, his or her sales also grew by 10%. An elegant correlation.

So the executives asked, How can we change our space to get the sales staff running into colleagues from other departments? In this case, the answer lay with coffee. At the time, the company had roughly one coffee machine for every six employees, and the same people used the same machines every day. The sales force commiserated with itself. Marketing people talked to marketing people.

The company invested several hundred thousand dollars to rip out the coffee stations and build fewer, bigger ones—just one for every 120 employees. It also created a large cafeteria for all employees in place of a much smaller one that few employees had used. In the quarter after the coffee-and-cafeteria switch, sales rose by 20%, or $200 million, quickly justifying the capital investment in the redesign.

Managers might be tempted to simply build big social spaces and expect great results, but it’s not
If you want to reconfigure your office space to improve performance, this simple grid will help you get started. It uses two important factors in office design—relative openness and seating flexibility—to suggest what configuration will lead to one of four distinct outcomes.

The type of interaction that’s most valuable changes according to goals; what doesn’t change is that interaction in itself is far more valuable than we realize. Sometimes circulating, exploring, engaging, and increasing the number of people’s collisions is more important than individual productivity or creativity. Imagine, for example, that a worker finds a better way to do her job but never tells anyone else doing the same job what she discovered. She has improved her performance but no one else’s. If she takes
time out of her day to tell others about what she’s learned, her productivity drops—but she has increased theirs. We’ve shown that in some cases even a 5% drop in personal productivity can have a positive outcome on group performance.

Think of the implications: First, most employee performance reviews are based on individual productivity and don't take into consideration how group productivity can grow through more interaction. Second, untold amounts of money are invested in tools to increase individual productivity, but the money might be better used to design a workplace that promotes collisions that will make the organization—not individuals—more successful.

**Lobbies as Offices**

One factor complicates all this: Office buildings are no longer the sole locations for knowledge work. In fact, research from the consulting group Emergent Research suggests that two-thirds of it now happens outside the office. Consequently, no matter how precisely we design office space to create collisions, the design is incomplete if it doesn’t take into account digital work and collaboration that are independent of space and time and for which immediacy is more important.

In some ways the digital workspace enhances in-person collisions with file-sharing and communication tools such as chat, e-mail, and archiving. It can gather more ideas from more places: Research indicates that interactions and engagement decrease as the physical distance between work groups gets bigger, whereas online engagement increases with the number of users. However, data show that digital communication can’t replace face-to-face interaction and may actually be enhanced by it (see the sidebar “The Allen Curve Holds”). Studies with sociometric badges confirm that remote teams don’t perform as well as those in physical proximity.

Furthermore, the upgrade cycles of buildings and technology don’t mesh. Telenor’s state-of-the-art campus, which smartly integrated digital
Flow of Technology, Thomas J. Allen was the first to measure the strong negative correlation between physical distance and frequency of communication. The “Allen curve” estimates that we are four times as likely to communicate regularly with someone sitting six feet away from us as with someone 60 feet away, and that we almost never communicate with colleagues on separate floors or in separate buildings.

But the office is no longer just a physical place; we can enter it by logging on, attend meetings from anywhere, and collaborate on documents without ever seeing one another. It would seem that distance-shrinking technologies break the Allen curve, and that communication no longer correlates to distance.

Wrong. The Allen curve holds. In fact, as distance-shrinking technology accelerates, proximity is apparently becoming more important. Studies by Ben Waber show that both face-to-face and digital communications follow the Allen curve. In one study, engineers who shared a physical office were 20% more likely to stay in touch digitally than those who worked elsewhere. When they needed to collaborate closely, co-located coworkers e-mailed four times as frequently as colleagues in different locations, which led to 32% faster project completion times.

Out of sight, out of sync.

Workers themselves have been the first to take on this challenge. Just as IT has been consumerized over the past decade, digital-savvy employees are beginning to demand that their spaces adapt to how they work, rather than vice versa. This shift began in earnest in 2005, in San Francisco, London, and Berlin. Technologists, programmers, and creative professionals wanted to work outside confining office environments but also to avoid the isolation of home offices. They chose to work side by side, in what are known as coworking spaces.

Early examples were organic, built by users rather than by design professionals. They were accessible to anyone and sometimes free. People who chose to work in those spaces intentionally sought members from different organizations, thus reproducing the community, social interaction, learning, and energy typical of their online work, while adding the benefit of physical features such as a wireless file-sharing system—was built four years before the iPhone was introduced and before Wi-Fi became ubiquitous. Just a few years later, Telenor’s then-novel proprietary wireless network would have been designed radically differently—if its features weren’t obviated by cloud storage and other developments. All of which is to say that understanding how digital and physical spaces work together is crucial to improving workspace but also an incredibly complicated design challenge.
proximity to others. Unwittingly, they were engineering spaces to create the exploration that we know enhances creativity. And it worked. Studying 45 coworking spaces around the world, one of us, Jennifer Magnolfi, discovered that people had chosen them because they believed that their performance would improve more rapidly in such spaces than in an office building or at home. A 2011 Deskmag survey of more than 1,500 coworkers in 52 countries supported her findings:

- 75% reported an increase in productivity since joining their space
- 80% reported an increase in the size of their business network
- 92% reported an increase in the size of their social circle
- 86% reported a decrease in their sense of isolation
- 83% reported that they trusted others in their coworking space

By 2013, according to data from Emergent Research, more than 160,000 people were using several thousand coworking spaces in the United States and Europe. The organization forecasts that in five years more than one million people will be using 12,000 coworking spaces globally. Another survey showed that by 2014, 72% of participants were forecasting an increase in their income.

By 2014, 72% of those who used coworking spaces were forecasting an increase in their income.

The growth of coworking and surveys of coworkers demonstrate that given the choice, people will choose workspaces that support their digital style while giving them access to new knowledge, exposing them to different kinds of expertise, and accelerating their learning. Coworking’s success has helped some teams “graduate” out of their coworking spaces. Although
the model clearly provides the exploration that independent workers and very small groups need, when teams reach a critical size, usually around 10 members, they need to up their engagement with one another. Private office space and conference rooms become necessary parts of their workday.

This has led to the scaling of coworking space. What started as small spaces for a few independent workers grew into start-up accelerators—groups of start-ups sharing some of the private collaboration space available to them. Eventually large corporations mimicked the idea by creating shared space where their employees could work with partners, researchers, and customers. The first floor of Amazon’s new campus in Seattle is mostly coworking space. Ace Hotel actively markets the lobby of its New York flagship as a workspace. AT&T has created Foundry, a network of research centers in which its engineers work side by side with handpicked start-ups, corporate partners, and third-party developers to bring new products to market faster. Even bankers are doing it: ING Direct built seven cafés (now called Capital One 360 Cafés) where its workers could set up shop and interact with customers who could also use the space for work. Perhaps less surprisingly, and true to form, Airbnb has made one of the conference rooms at its new headquarters bookable (through Airbnb, of course) by anyone in San Francisco, free.

**What’s Happening in Vegas**

Coworking is succeeding because it successfully integrates good workspace design that enhances exploration with the digital work habits of individuals and small teams. In some cases it’s possible to scale the benefits of coworking—such as high collision rates and accelerated learning—to build an entire neighborhood.

The Downtown Project, in Las Vegas, is an early example of the concept. Tony Hsieh, the CEO of Zappos, is investing $350 million in the area around the company’s new headquarters, which is the former city hall. Hsieh’s goal is to grow the local start-up and entrepreneurial community in a way that will organically attract talent to the area, benefiting both Zappos employees and the neighborhood.

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**BY THE SAME AUTHOR**

6 New Workspaces That Are Killing the Corporate Campus

CREATIVITY ARTICLE by Greg Lindsay

A visual taxonomy.

Jennifer Magnolfi participated in the development and analysis of coworking space inside Zappos headquarters and led a local coworking experiment that launched in early 2012 and eventually grew to include nearly 200
stakeholders, among them Zappos employees, area residents, start-ups, independent workers, and others. The spaces were improvised from a network of existing ones: a coffee shop, the courtyard of a Thai restaurant, an old church hall, the lobby of a casino, and an empty corporate apartment.

Early results show that the small, shared nature of the neighborhood fostered mobility that created collisions on a greater scale. Exploration and energy were very high. After six months, data revealed a 42% increase in face-to-face encounters, a 78% increase in participant-generated proposals to solve specific problems, and an 84% increase in the number of new leaders—participants who initiated work and collaboration and developed project scope and objectives. Ten new civic and local community projects were launched—including the Sunday Reset Project, a monthly event to promote healthful living.

Zappos and the Downtown Project have continued experimenting with the area and are using a new metric: “collisionable hours,” or the number of probable interactions per hour per acre. Hsieh’s goal is to reach 100,000 collisionable hours per acre in the neighborhood—about 2.3 per square foot per year.

Zappos uses a new metric—“collisionable hours”—to measure a space’s effectiveness.

The Downtown Project is still a controlled experiment. It doesn’t capture the complexity of getting companies and civic entities to cooperate, routinely and continually, while also adapting to inevitable technological change. Nor does it address the complexity of getting a multinational to integrate coworking space when it’s already managing a global office portfolio. (See the sidebar “What About the Global Company?”) But it points to a new model for the corporate campus of the future that weaves together public and private spaces, employees and partners, living and working. Hsieh and others believe that companies designed on this model will be more productive and innovative—as businesses and as communities—and in the long term will gain a strategic advantage over companies that cut off their employees from the exploration that improves performance.

More than a century ago, Frederick Winslow Taylor brought his stopwatch and principles of scientific management to the office, instilling
What happens when proximity isn’t feasible? When our colleagues are not only in different buildings but in different countries?

One consumer packaged goods company we know of is trying to address these questions. It has a global real estate portfolio of more than 200 million square feet supporting 300,000 employees in 26 countries. Managing for collisions at this scale requires a two-pronged approach. First, like Telenor, the company must treat the buildings as communication tools, using more open environments and denser workspaces to promote interactions.

Second, it must link those optimized buildings in a virtual space that makes communication between them as easy and effective as possible. To achieve that, it has created a “community manager” role for workspace operations, bridging facilities management, technology, and corporate communications. The role is modeled on those found in online communities such as Yelp and Airbnb and in coworking spaces. The company’s community manager tries to create virtual collisions by making it easy for people who can’t interact in person to connect through online and social channels.

efficiency as the highest calling in what was then a factory for processing paperwork. Today we have the means to measure the performance of modern idea factories. Even these early insights suggest a future in which we must aggressively change the definition of what workspace is, from where work is done to how it’s done, and then design spaces—physical and digital—around that. The office of the past was a literal box of cubicles and desks, meeting rooms and common spaces. In the office of the future, we’ll be thinking and working outside it.

A version of this article appeared in the October 2014 issue of Harvard Business Review.
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