HBR.ORG

Harvard Business Review

SEPTEMBER 2015

44 The Big Idea
The Organizational "I'm Sorry"
Maurice E. Schweitzer et al.

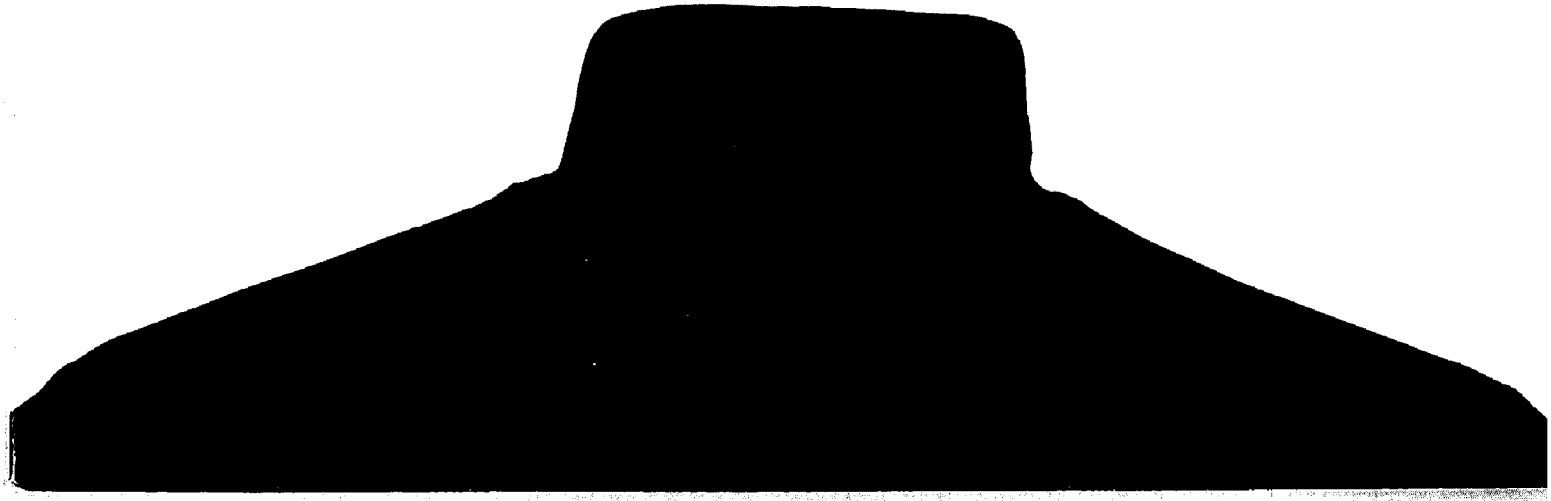
86 Risk Management
Cybersecurity: Lessons from the Pentagon
James A. "Sandy" Winnefeld Jr. et al.

108 Managing Yourself
How to Embrace Complex Change
Linda Brimm

THE EVOLUTION OF DESIGN THINKING

IT'S NO LONGER JUST FOR PRODUCTS. EXECUTIVES ARE USING THIS APPROACH TO DEVISE STRATEGY AND MANAGE CHANGE.

PAGE 55



SPOTLIGHT

56
Design for Action
by Tim Brown and Roger Martin

66
Design Thinking Comes of Age
by Jon Kolko

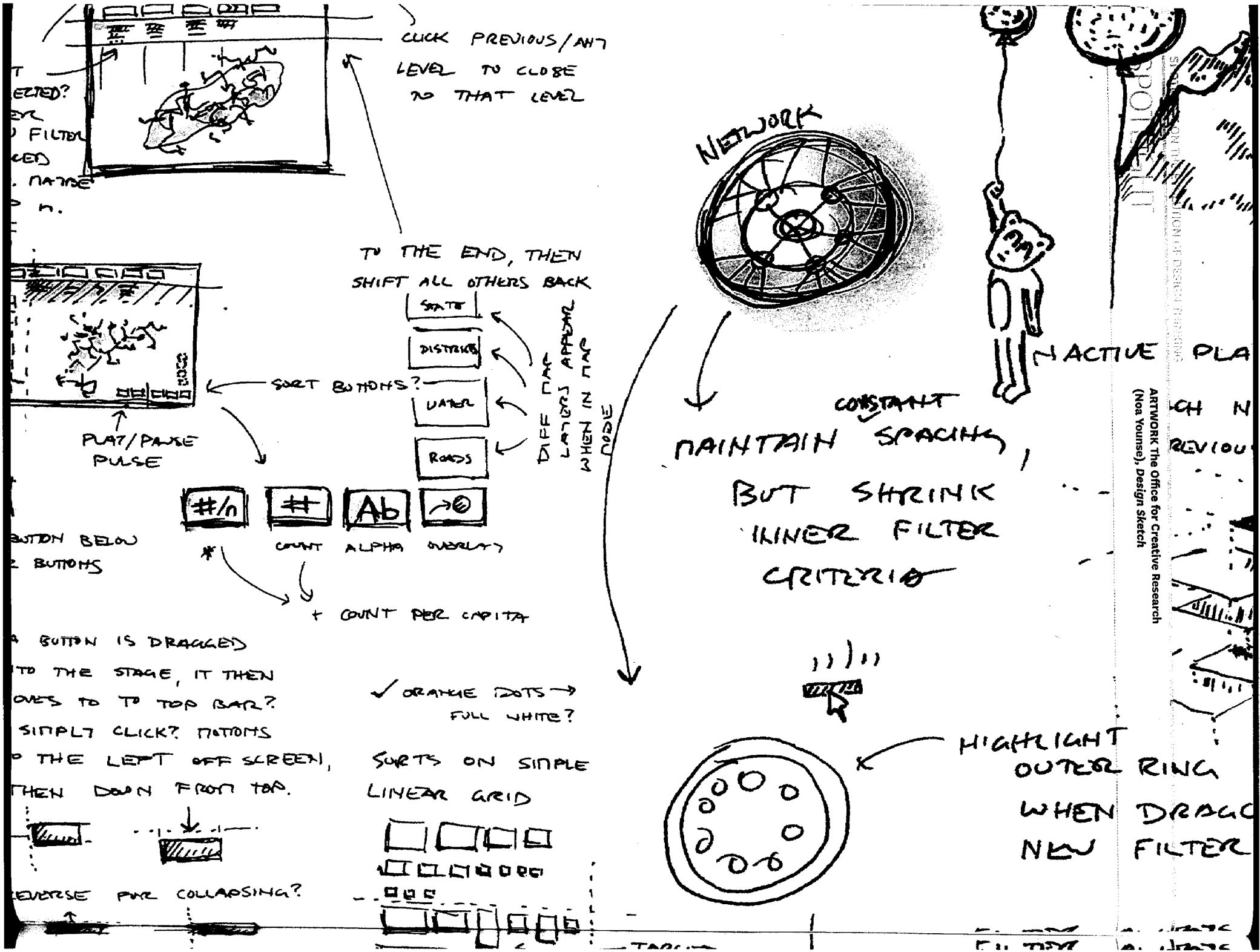
72
How Samsung Became a Design Powerhouse
by Youngjin Yoo and Kyungmook Kim

80
How Indra Nooyi Turned Design Thinking into Strategy
An interview with Ad Ignatius

The Evolution of Design Thinking

Once confined to product development, design thinking has become central to strategy, innovation, and organizational culture.

ARTWORK The Office for Creative Research (Jer Thorp)
Lightning Strike Visualization

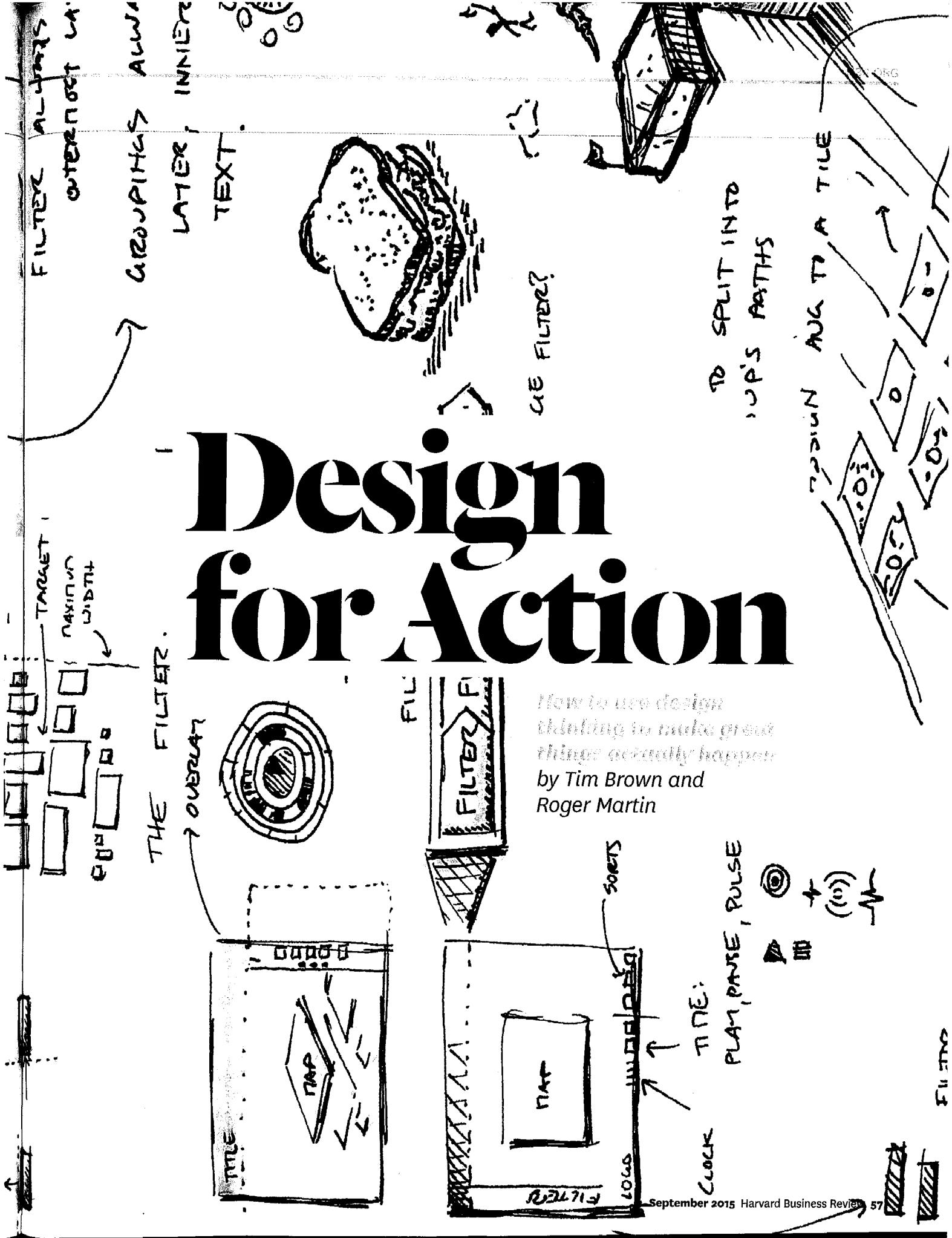


ARTWORK The Office for Creative Research (Noa Younse), Design Sketch

Design for Action

How to use design thinking to make great things actually happen

by Tim Brown and Roger Martin



Throughout most of history, design was a process applied to physical objects.

Frank Lloyd Wright designed houses. Charles Eames designed furniture. **Coco Chanel designed haute couture. Paul Rand designed logos. David Kelley designed products, including (most famously) the mouse for the Apple computer.**

But as it became clear that smart, effective design was behind the success of many commercial goods, companies began employing it in more and more contexts. High-tech firms that hired designers to work on hardware (to, say, come up with the shape and layout of a smartphone) began asking them to create the look and feel of user-interface software. Then designers were asked to help improve user experiences. Soon firms were treating corporate strategy making as an exercise in design. Today design is even applied to helping multiple stakeholders and organizations work better as a system.

This is the classic path of intellectual progress. Each design process is more complicated and sophisticated than the one before it. Each was enabled by learning from the preceding stage. Designers could easily turn their minds to graphical user interfaces for software because they had experience designing the hardware on which the applications would run. Having crafted better experiences for computer users, designers could readily take on nondigital experiences, like patients' hospital visits. And once they learned how to redesign the user experience in a single organization, they were more prepared to tackle the holistic experience in a system of organizations. The San Francisco Unified School District, for example, recently worked with IDEO to help redesign the cafeteria experience across all its schools.

As design has moved further from the world of products, its tools have been adapted and extended into a distinct new discipline: design thinking. Arguably, Nobel laureate Herbert Simon got the ball rolling with the 1969 classic *The Sciences of the Artificial,* which characterized design not so much as a physical process as a way of thinking. And Richard Buchanan made a seminal advance in his 1992 article "Wicked Problems in Design Thinking," in which he proposed using design to solve extraordinarily persistent and difficult challenges.

But as the complexity of the design process increases, a new hurdle arises: the acceptance of what we might call "the designed artifact"—whether product, user experience, strategy, or complex system—by stakeholders. In the following pages we'll explain this new challenge and demonstrate how design thinking can help strategic and system innovators make the new worlds they've imagined come to pass. In fact, we'd argue that with very complex artifacts, the design of their "intervention"—their introduction and integration into the status quo—is even more critical to success than the design of the artifacts themselves.

Idea in Brief

THE PROBLEM

Complex new designs of products (e.g., a hybrid vehicle) or systems (like a school system) typically struggle to gain acceptance. Many good groundbreaking ideas fail in the starting gate.

WHY IT HAPPENS

New designs can threaten other players, prompt to change assumptions, processes, practices and behaviors. As a result, they encounter resistance from those affected by changes and from the people who have to deliver or operate them.

THE SOLUTION

Treat the introduction of the new product or process—its designed intervention—as a design challenge itself. Without using design, Perry took that approach. It won acceptance for a new education platform in which the teachers facilitate learning rather than serve as the sole lesson provider.

The New Challenge

The launch of a new product that resembles a company's other offerings—say, a hybrid version of an existing car model—is typically seen as a positive thing. It produces new revenue and few perceived downsides for the organization. The new vehicle doesn't cause any meaningful changes to the organization or the way its people work, so the design isn't inherently threatening to anyone's job or to the current power structure.

Of course, introducing something new is always worrisome. The hybrid might fail in the marketplace. That would be costly and embarrassing. It might cause other vehicles in the portfolio to be phased out, producing angst for those who support the older models. Yet the designer usually pays little attention to such concerns. Her job is to create a truly great new car, and the knock-on effects are left to others—people in marketing or HR—to manage.

The more complex and less tangible the designed artifact is, though, the less feasible it is for the designer to ignore its potential ripple effects. The business model itself may even need to be changed. That means the introduction of the new artifact requires design attention as well.

Consider this example: A couple of years ago, MassMutual was trying to find innovative ways to persuade people younger than 40 to buy life insurance—a notoriously hard sell. The standard approach would have been to design a special life insurance product and market it in the conventional way. But MassMutual concluded that this was unlikely to work. Instead the company worked with IDEO to design a completely new type of customer experience focused more broadly on educating people about long-term financial planning.

Launched in October 2014, "Society of Grownups" was conceived as a "master's program for adulthood." Rather than delivering it purely as an online course, the company made it a multichannel experience, with state-of-the-art digital budgeting and financial-planning tools, offices with classrooms and a library customers could visit, and a curriculum that included everything from investing in a 401(k) to buying good-value wine. That approach was hugely disruptive to the organization's norms and processes, as it required not only a new brand and new digital tools but also new ways of working. In fact, every aspect of the organization had to be redesigned for the new service, which is intended to evolve as participants provide MassMutual with fresh insights into their needs.

When it comes to very complex artifacts—say, an entire business ecosystem—the problems of integrating a new design loom larger still. For example, the successful rollout of self-driving vehicles will require automobile manufacturers, technology providers, regulators, city and national governments, service firms, and end users to collaborate in new ways and engage in new behaviors. How will insurers work with manufacturers and users to analyze risk? How will data collected from self-driving cars be shared to manage traffic flows while protecting privacy?

New designs on this scale are intimidating. No wonder many genuinely innovative strategies and systems end up on a shelf somewhere—never acted on in any way. However, if you approach a large-scale change as two simultaneous and parallel challenges—the design of the artifact in question and the design of the intervention that brings it to life—you can increase the chances that it will take hold.

Designing the Intervention

Intervention design grew organically out of the iterative prototyping that was introduced to the design

process as a way to better understand and predict customers' reactions to a new artifact. In the traditional approach, product developers began by studying the user and creating a product brief. Then they worked hard to create a fabulous design, which the firm launched in the market. In the design-oriented approach popularized by IDEO, the work to understand users was deeper and more ethnographic than quantitative and statistical.

Initially, that was the significant distinction between the old and new approaches. But IDEO realized that no matter how deep the up-front understanding was, designers wouldn't really be able to predict users' reactions to the final product. So IDEO's designers began to reengage with the users sooner, going to them with a very low-resolution prototype to get early feedback. Then they kept repeating the process in short cycles, steadily improving the product until the user was delighted with it. When IDEO's client actually launched the product, it was an almost guaranteed success—a phenomenon that helped make rapid prototyping a best practice.

Iterative rapid-cycle prototyping didn't just improve the artifact. It turned out to be a highly effective way to obtain the funding and organizational commitment to bring the new artifact to market. A new product, especially a relatively revolutionary one, always involves a consequential bet by the management team giving it the green light.

Often, fear of the unknown kills the new idea. With rapid prototyping, however, a team can be more confident of market success. This effect turns out to be even more important with complex, intangible designs.

In corporate strategy making, for example, a traditional approach is to have the strategist—whether in-house or a consultant—define the problem, devise the solution, and present it to the executive in charge. Often that executive has one of the following reactions: (1) This doesn't address the problems I think are critical. (2) These aren't the possibilities I would have considered. (3) These aren't the things I would have studied. (4) This isn't an answer that's compelling to me. As a consequence, winning commitment to the strategy tends to be the exception rather than the rule, especially when the strategy represents a meaningful deviation from the status quo.

The answer is iterative interaction with the decision maker. This means going to the responsible

The Launch Is Just One Step in the Process

In his book *Sketching User Experiences*, user interface pioneer Bill Buxton describes the Apple iPod as the "overnight success" that took three years to happen. He documents the many design changes to the device that took place after its launch—and were essential to its eventual success.

As this story illustrates, a sophisticated designer recognizes that the task is first to build user acceptance of a new platform and later to add new features. When Jeff Hawkins developed the PalmPilot, the world's first successful personal digital assistant, he insisted that it focus on only three things—a calendar, contacts, and notes—because he felt users initially could not handle complexity greater than that. Over time the PalmPilot evolved to include many more functions, but by then the core market understood the experience. The initial pitch for the iPod was an extremely simple "1,000 songs in your pocket." The iTunes store, photos, games, and apps came along later, as users adopted the platform and welcomed more complexity.

As strategies and large systems become the focus of design thinking, imagining the launch as just one of many steps in introducing a new concept will become even more important. Before the launch, designers will confront increasing complexity in early dialogues with both the artifact's intended users and the decision maker responsible for the design effort. A solution with purposely lower complexity will be introduced, but it will be designed to evolve as users respond. Iteration and an explicit role for users will be a key part of any intervention design.

New information and computing technologies will make it far easier to create and share early prototypes, even if they are complex systems, and gain feedback from a more diverse population of users. In this new world, the launch of a new design ceases to be the focus. Rather, it is just one step somewhere in the middle of a carefully designed intervention.

—Tim Brown

executive early on and saying, "We think this is the problem we need to solve; to what extent does that match your view?" Soon thereafter the strategy designers go back again and say, "Here are the possibilities we want to explore, given the problem definition we agreed on; to what extent are they the possibilities you imagine? Are we missing some, and are any we're considering nonstarters for you?" Later the designers return one more time to say, "We plan to do these analyses on the possibilities that we've agreed are worth exploring; to what extent are they analyses that you would want done, and are we missing any?"

With this approach, the final step of actually introducing a new strategy is almost a formality. The executive responsible for green-lighting it has helped define the problem, confirm the possibilities, and affirm the analyses. The proposed direction is no longer a jolt from left field. It has gradually won commitment throughout the process of its creation.

When the challenge is introducing change to a system—by, say, establishing a new kind of business or a new kind of school—the interactions have to extend even further, to all the principal stakeholders. We'll now look at an example of this kind of intervention design, which involved a major experiment in social engineering that's taking place in Peru.

Designing a New Peru

Intercorp Group is one of Peru's biggest corporations, controlling almost 30 companies across a wide variety of industries. Its CEO, Carlos Rodríguez-Pastor Jr., inherited the company from his father, a former political exile who, upon his return in 1994, led a consortium that bought one of Peru's largest banks, Banco Internacional del Peru, from the government. Rodríguez-Pastor took control of the bank when his father died, in 1995.

Rodríguez-Pastor wanted to be more than a banker. His ambition was to help transform Peru's economy by building up its middle class. In the newly renamed Interbank he saw an opportunity to both create middle-class jobs and cater to middle-class needs. From the outset, however, he grasped that he couldn't achieve this goal with the "great man" approach to strategy characteristic of the large, family-controlled conglomerates that often dominate emerging economies. Reaching it would take the carefully engineered engagement of many stakeholders.

Seeding a culture of innovation. The first task was making the bank competitive. For ideas, Rodríguez-Pastor decided to look to the leading financial marketplace in his hemisphere, the United States. He persuaded an analyst at a U.S. brokerage house to let him join an investor tour of U.S. banks, even though Interbank wasn't one of the broker's clients.

If he wanted to build a business that could trigger social change, absorbing some insights by himself and bringing them home wouldn't be enough, Rodríguez-Pastor realized. If he simply imposed his own ideas, buy-in would depend largely on his authority—not a context conducive to social transformation. He needed his managers to learn how to develop insights too, so that they could also spot and seize opportunities for advancing his broader ambition. So he talked the analyst into allowing four of his colleagues to join the tour.

This incident was emblematic of his participative approach to strategy making, which enabled Rodríguez-Pastor to build a strong, innovative management team that put the bank on a competitive footing and diversified the company into a range of businesses catering to the middle class: supermarkets, department stores, pharmacies, and cinemas. By 2015 Intercorp, the group built around Interbank, employed some 55,000 people and had projected revenues of $5 billion.

Over the years, Rodríguez-Pastor has expanded his investment in educating the management team. He sent managers each year to programs at top schools and companies (such as Harvard Business School and IDEO) and worked with those institutions to develop new programs for Intercorp, tossing out ideas that didn't work and refining ones that did. Most recently, in conjunction with IDEO, Intercorp launched its own design center, La Victoria Lab. Located in an up-and-coming area of Lima, it serves as the core of a growing urban innovation hub.

But Rodríguez-Pastor didn't stop at creating an innovative business group targeting middle-class consumers. The next step in his plan for social transformation involved moving Intercorp outside the traditional business domain.

From wallets to hearts and minds. Good education is critical to a thriving middle class, but Peru was severely lagging in this department. The country's public schools were lamentable, and the private sector was little better at equipping children for a middle-class future. Unless that

Intervention Design at Innova

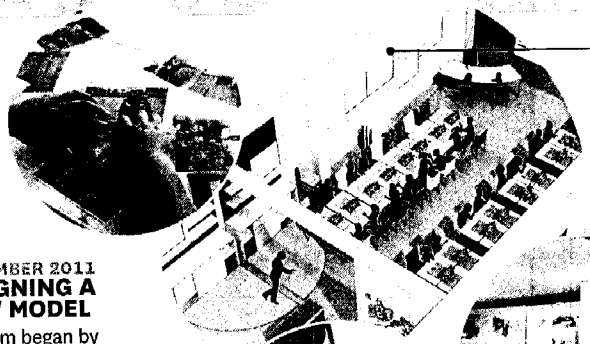
SETTING THE STAGE

Innova Schools launched its initiative to bring affordable education to Peru by holding information sessions on its interactive-learning approach with local parents and students.

SEPTEMBER 2011

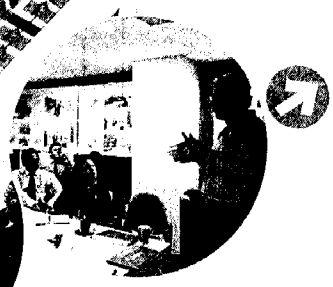
DESIGNING A NEW MODEL

The team began by exploring the lives and motivations of Innova's many stakeholders to find out how it could create a system that would engage teachers, students, and parents.



Final design guidelines were created for the classroom space, the schedule, teaching methods, and the role of the teacher.

Ideas began to crystallize around a technology-enabled model that shifted the teacher from "sage on stage" to "guide on the side" and would make schools affordable and scalable. Teachers tried out software tools and provided feedback on them.



As that strategy solidified, Innova held many sessions with teachers, parents, and school leaders to get feedback on classroom design, discuss ways the schools would evolve, and invite stakeholders into the process of implementation.

changed, a positive cycle of productivity and prosperity was unlikely to emerge. Rodríguez-Pastor concluded that Intercorp would have to enter the education business with a value proposition targeted at middle-class parents.

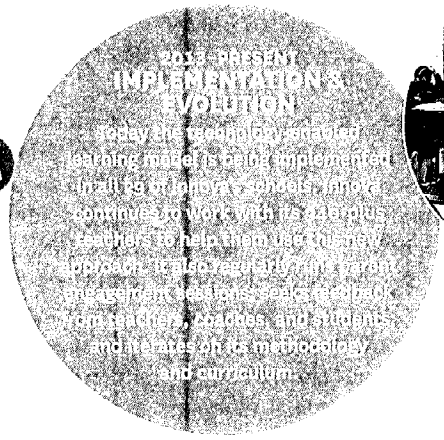
Winning social acceptability for this venture was the real challenge—one complicated by the fact that education is always a minefield of vested interests. An intervention design, therefore, would be critical to the schools' success. Rodríguez-Pastor worked closely with IDEO to map one out. They began by priming the stakeholders, who might well balk at the idea of a large business group operating schools for children—a controversial proposition even in a business-friendly country like the United States.

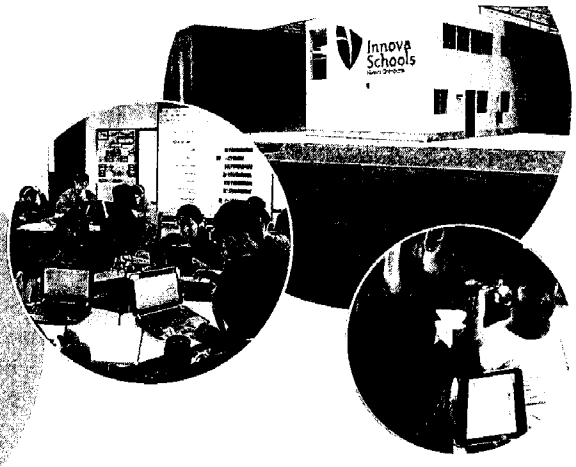
Intercorp's first move was starting an award in 2007 for "the teacher who leaves a footprint," given to the best teacher in each of the country's 25 regions. It quickly became famous, in part because every teacher who received it also won a car. This established Intercorp's genuine interest in improving education in Peru and helped pave the way for teachers, civil servants, and parents to accept the idea of a chain of schools owned by the company.

Next, in 2010 Intercorp purchased a small school business called San Felipe Neri, managed by entrepreneur Jorge Yzusqui Chessman. With one school in operation and two more in development, Chessman had plans for growth, but Intercorp's experience in building large-scale businesses in Peru could take the venture far beyond what he envisioned. However, the business would have to reengineer its existing model, which required highly skilled teachers, who were in extremely short supply in Peru. Rodríguez-Pastor brought together managers from his other businesses—a marketing expert from his bank, a facilities expert from his supermarket chain, for instance—with IDEO to create a new model, Innova Schools. It would offer excellent education at a price affordable for middle-class families.

The team launched a six-month human-centered design process. It engaged hundreds of students, teachers, parents, and other stakeholders, exploring their needs and motivations, involving them in testing approaches, and soliciting their feedback on classroom layout and interactions. The result was a technology-enabled model that incorporated platforms such as the U.S. online-education pioneer

NOVEMBER 2012
PILOTING THE PROGRAM
Full pilots were run in two seventh-grade classrooms in two schools. Teachers were thoroughly trained in the new approach, and the model was repeatedly adapted to address their real-time feedback.





Khan Academy. In it the teacher was positioned as a facilitator rather than the sole lesson provider.

The intervention design challenge was that parents might object to having their children learn via laptops in the classroom, and teachers might rebel at the notion of supporting learning rather than leading it. So after six months of preparation, Innova launched a full-scale pilot and brought in parents and teachers to design and run it.

The pilot demonstrated that students, parents, and teachers loved the model, but some of the assumptions were far off base. Parents didn't object to the teaching approach; in fact, they insisted that the laptops not be taken away at the end of the pilot. Additionally, 85% of the students used the laptops outside classroom hours. The model was tweaked on the basis of the insights from the pilot, and both the parents and teachers became huge advocates for the Innova model in nearby locations.

Word of mouth spread, and soon the schools were fully enrolled before they were even built. Because Innova had a reputation for innovation, teachers wanted to work there, even though it paid less than the public system. With 29 schools up and running, Innova is now on track to meet its goal of 70 schools by 2020 and plans to expand into every market in Peru and even markets outside the country.

Spreading the wealth. If it followed conventional business wisdom, Intercorp would have focused on the richer parts of the country's capital, Lima, where a middle class was naturally emerging. But Rodríguez-Pastor recognized that the provinces needed a middle class as well. Fostering one there obviously involved job creation. One way Intercorp could create jobs was to expand its supermarket chain, which it had purchased from Royal Ahold in 2003 and renamed Supermercados Peruanos.

In 2007 the chain began establishing stores in the provinces. Local consumers were certainly receptive to the idea. When one store opened in Huancayo, curious customers queued up for an hour or more to enter it. For many it was their first experience with modern retail. By 2010 the chain was operating 67 supermarkets in nine regions. Today it boasts 102 stores nationwide.

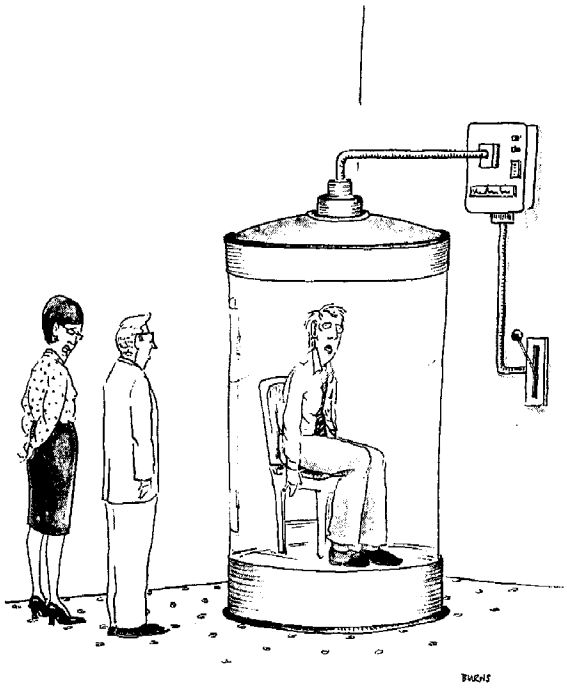
Early on, Intercorp realized that retail ventures of this kind risked impoverishing local communities rather than enriching them. Though a supermarket

did provide well-paid jobs, it could hurt the business of local farmers and producers. Since they were small scale and usually operated with low food-safety standards, it would be tempting to source almost everything from Lima. But the logistics costs of doing that would erode profit margins, and if the chain crowded out the local producers, it might destroy more jobs than it created.

Intercorp thus needed to stimulate local production through early engagement with local businesses. In 2010 the company launched the Perú Pasión program, with support from the Corporación Andina de Fomento (an NGO) and Huancayo's regional government. Perú Pasión helps farmers and small manufacturers upgrade their capabilities enough to supply their local Supermercados Peruano. Over time some of these suppliers have even developed into regional or national suppliers in their own right.

Currently, Supermercados Peruanos sources 218 products, representing approximately $1.5 million in annual sales, from Perú Pasión businesses. One is Procesadora de Alimentos Velasquez. Originally a neighborhood bakery serving a few small nearby grocery shops, it began supplying a Supermercados store in 2010, generating just $6,000 in annual sales. Today, thanks to Perú Pasión's help, it supplies three stores for nearly $40,000 in annual sales. Concepción Lacteos, a dairy producer, is another success. In 2010 it began supplying its local Supermercados store for about $2,500 in annual sales. In 2014 it supplied 28 stores, including the chain's upscale outlets in Lima, and generated $100,000 in sales.

Intercorp's success in boosting the middle class in Peru depended on the thoughtful design of many artifacts: a leading-edge bank, an innovative school system, and businesses adapted for frontier towns across Peru. But equally important has been the design of the introduction of these new artifacts into the status quo. Rodríguez-Pastor carefully mapped out the steps necessary to engage all the relevant parties in their adoption. He deepened the skills of the executives on his leadership team, increased the design know-how of his people, won over teachers and parents to the idea that a conglomerate could provide education, and partnered with local producers to build their capacity to supply supermarkets. In conjunction with well-designed artifacts, these carefully designed interventions have made the social transformation of Peru a real possibility rather than an idealistic aspiration.



"...and this is our meeting simulation tank, where associates train for the rigors of long-term sitting."

THE PRINCIPLES of this approach are clear and consistent. Intervention is a multistep process—consisting of many small steps, not a few big ones. Along the entire journey interactions with the users of a complex artifact are essential to weeding out bad designs and building confidence in the success of good ones.

Design thinking began as a way to improve the process of designing tangible products. But that's not where it will end. The Intercorp story and others like it show that design thinking principles have the potential to be even more powerful when applied to managing the intangible challenges involved in getting people to engage with and adopt innovative new ideas and experiences.

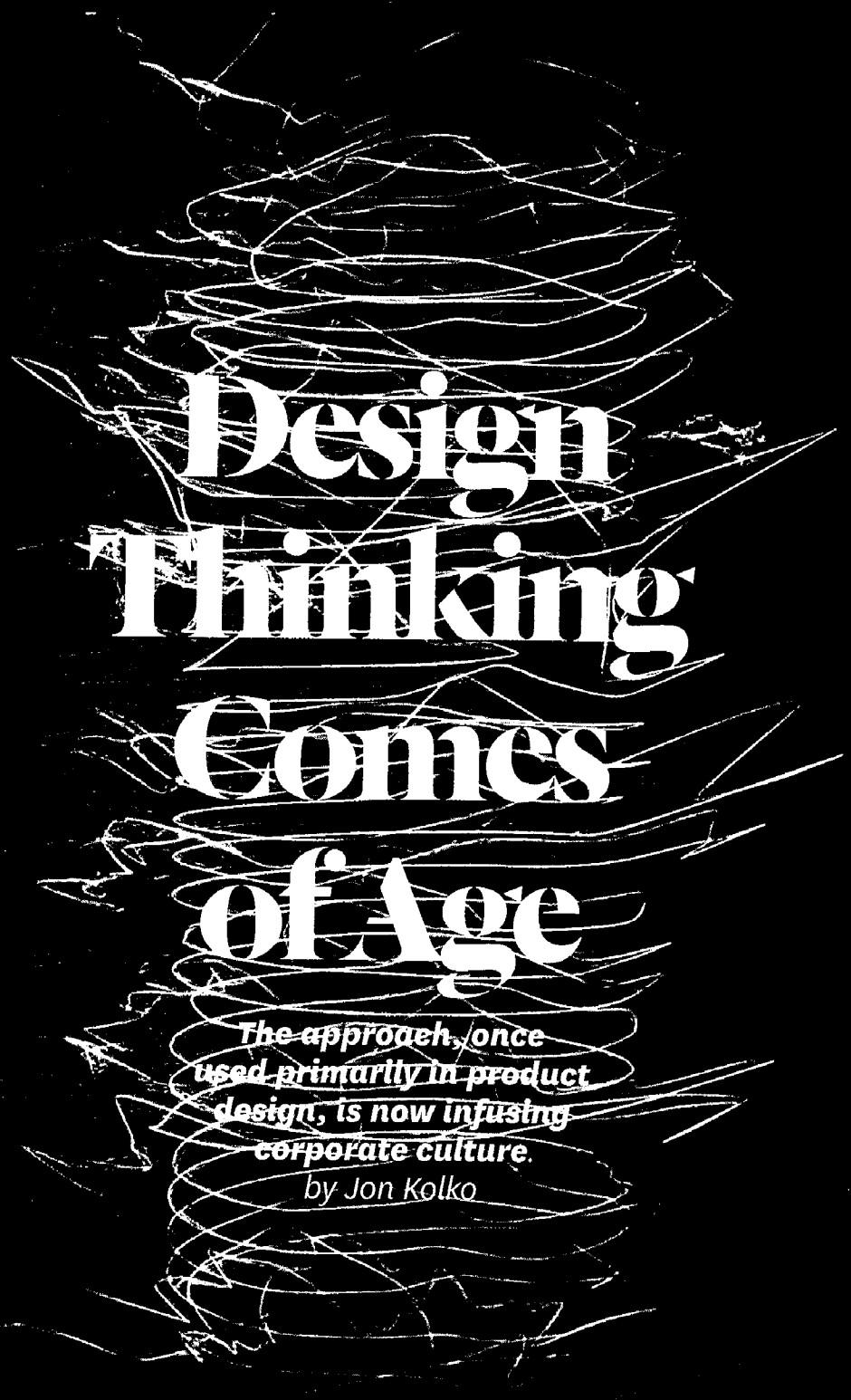
HBR Reprint R1509C

Tim Brown is the CEO and president of the international design consulting firm IDEO and the author of *Change by Design* (HarperBusiness, 2009). A professor at and former dean of the Rotman School of Management, **Roger Martin** is a coauthor of *Getting Beyond Better* (Harvard Business Review Press, forthcoming) and *Playing to Win* (Harvard Business Review Press, 2013).

BURNS

SPOTLIGHT

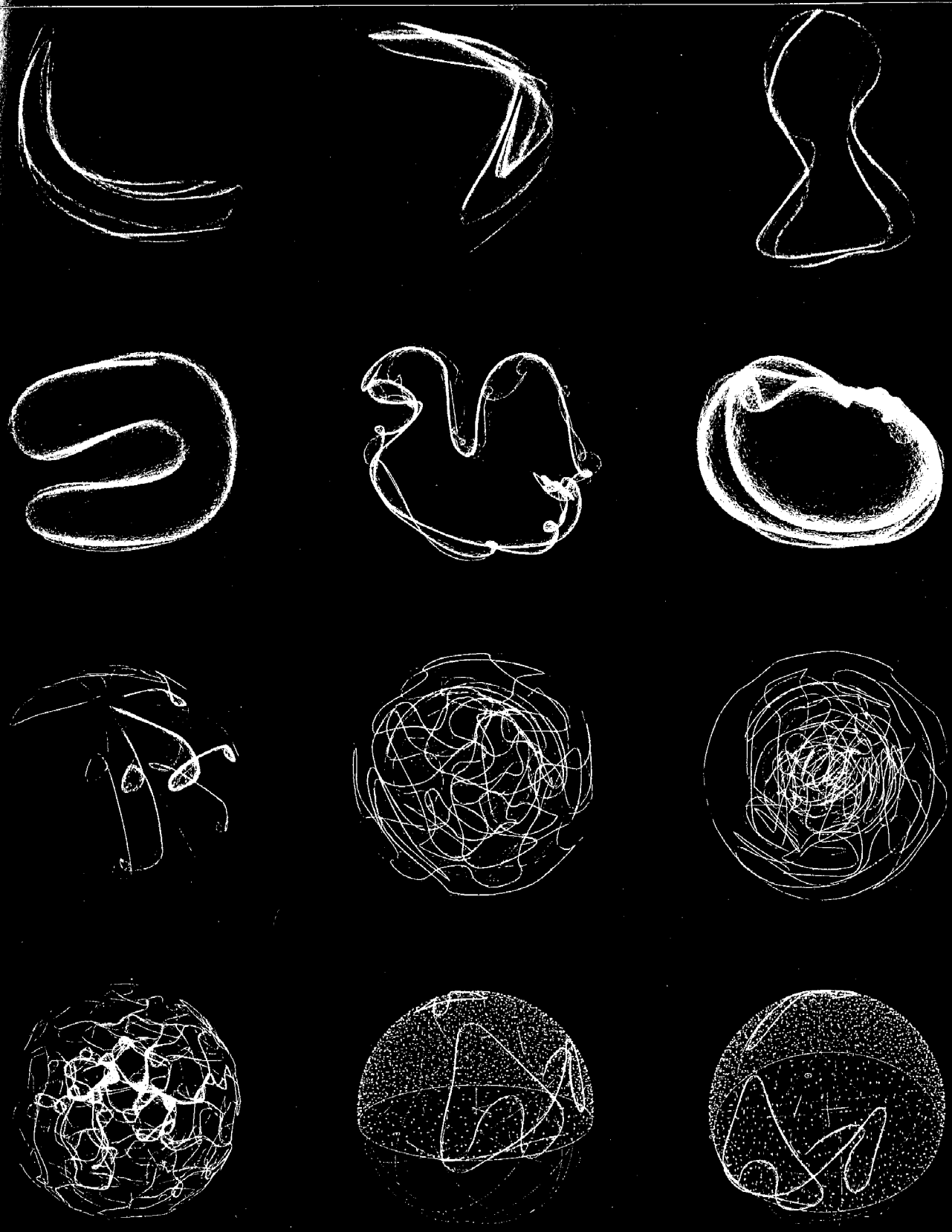
ARTWORK The Office for Creative Research (Noa Younse), *Band, Preliminary Visualization*



Design Thinking Comes of Age

The approach, once used primarily in product design, is now infusing corporate culture.

by Jon Kolko



one that puts design much closer to the center of the enterprise.

But the shift isn't about aesthetics. It's about applying the principles of design to the way people work.

This new approach is in large part a response to the increasing complexity of modern technology and modern business. That complexity takes many forms. Sometimes software is at the center of a product and needs to be integrated with hardware (itself a complex task) and made intuitive and simple from the user's point of view (another difficult challenge). Sometimes the problem being tackled is itself multifaceted: Think about how much tougher it is to reinvent a health care delivery system than to design a shoe. And sometimes the business environment is so volatile that a company must experiment with multiple paths in order to survive.

I could list a dozen other types of complexity that businesses grapple with every day. But here's what they all have in common: People need help making sense of them. Specifically, people need their interactions with technologies and other complex systems to be simple, intuitive, and pleasurable.

A set of principles collectively known as *design thinking*—empathy with users, a discipline of prototyping, and tolerance for failure chief among them—is the best tool we have for creating those kinds of interactions and developing a responsive, flexible organizational culture.

What Is a Design-Centric Culture?

If you were around during the late-1990s dot-com craze, you may think of designers as 20-somethings shooting Nerf darts across an office that looks more like a bar. Because design has historically been equated with aesthetics and craft, designers have been celebrated as artistic savants. But a design-centric culture transcends design as a role, imparting a set of principles to all people who help bring ideas to life. Let's consider those principles.

Focus on users' experiences, especially their emotional ones. To build empathy with users, a design-centric organization empowers employees to observe behavior and draw conclusions about what people want and need. Those conclusions are tremendously hard to express in quantitative language. Instead, organizations that "get" design use emotional language (words that concern desires, aspirations, engagement, and experience) to describe products and users. Team members discuss the emotional resonance of a value proposition as much as they discuss utility and product requirements.

A traditional value proposition is a promise of utility: If you buy a Lexus, the automaker promises that you will receive safe and comfortable transportation in a well-designed high-performance vehicle. An emotional value proposition is a promise of feeling: If you buy a Lexus, the automaker promises that you will feel pampered, luxurious, and affluent. In design-centric organizations, emotionally charged language isn't denigrated as thin, silly, or biased. Strategic conversations in those companies frequently address how a business decision or a market trajectory will positively influence users' experiences and often acknowledge only implicitly that well-designed offerings contribute to financial success.

The focus on great experiences isn't limited to product designers, marketers, and strategists—it infuses every customer-facing function. Take finance. Typically, its only contact with users is through invoices and payment systems, which are designed for internal business optimization or predetermined "customer requirements." But those systems are touch points that shape a customer's impression of the company. In a culture focused on customer experience, financial touch points are designed around users' needs rather than internal operational efficiencies.

Create models to examine complex problems. Design thinking, first used to make physical objects, is increasingly being applied to complex, intangible issues, such as how a customer experiences a service. Regardless of the context, design thinkers tend to use physical models, also known as *design artifacts,* to explore, define, and communicate. Those models—primarily diagrams and sketches—supplement and in some cases replace the spreadsheets, specifications, and other documents that

Idea in Brief

THE CHANGE
Increasingly, corporations and professional services firms are working to create design-centric cultures.

THE REASON
Many products, services, and processes are now technologically complex. People are not hardwired to deal well with high levels of complexity. They need help.

THE IDEA
People need their interactions with technologies and other complex systems to be intuitive and pleasurable. Empathy, experimentation, design smarts, and other qualities help create those kinds of interactions. Those qualities need to spread from the product design function to the whole organization.

have come to define the traditional organizational environment. They add a fluid dimension to the exploration of complexity, allowing for nonlinear thought when tackling nonlinear problems.

For example, the U.S. Department of Veterans Affairs' Center for Innovation has used a design artifact called a customer journey map to understand veterans' emotional highs and lows in their interactions with the VA. "This form of artifact helped us better tell a story to various stakeholders," says Melissa Chapman, a designer who worked at the Center for Innovation. Even more important, she adds, it "helped us develop a strategic way to think about changing the entire organization and to communicate that emergent strategy." The customer journey map and other design models are tools for understanding. They present alternative ways of looking at a problem.

Use prototypes to explore potential solutions. In design-centric organizations, you'll typically see prototypes of new ideas, new products, and new services scattered throughout offices and meeting rooms. Whereas diagrams such as customer journey maps explore the problem space, prototypes explore the solution space. They may be digital, physical, or diagrammatic, but in all cases they are a way to communicate ideas. The habit of publicly displaying rough prototypes hints at an open-minded culture, one that values exploration and experimentation over rule following. The MIT Media Lab formalizes this in its motto, "Demo or die," which recognizes that only the act of prototyping can transform an idea into something truly valuable—on their own, ideas are a dime a dozen. Design-centric companies aren't shy about tinkering with ideas in a public forum and tend to iterate quickly on prototypes—an activity that the innovation expert Michael Schrage refers to as "serious play." In his book of that title, he writes that innovation is "more social than personal." He adds, "Prototyping is probably the single most pragmatic behavior the innovative firm can practice."

Tolerate failure. A design culture is nurturing. It doesn't encourage failure, but the iterative nature of the design process recognizes that it's rare to get things right the first time. Apple is celebrated for its successes, but a little digging uncovers the Newton tablet, the Pippin gaming system, and the Copland operating system—products that didn't fare so well. (Pippin and Copland were discontinued after only two years.) The company leverages failure as learning, viewing it as part of the cost of innovation.

Greg Petroff, the chief experience officer at GE Software, explains how the iterative process works at GE: "GE is moving away from a model of exhaustive product requirements. Teams learn what to do in the process of doing it, iterating, and pivoting." Employees in every aspect of the business must realize that they can take social risks—putting forth half-baked ideas, for instance—without losing face or experiencing punitive repercussions.

Exhibit thoughtful restraint. Many products built on an emotional value proposition are simpler than competitors' offerings. This restraint grows out of deliberate decisions about what the product should do and, just as important, what it should not do. By removing features, a company offers customers a clear, simple experience. The thermostat Nest—inside, a complex piece of technology—provides fewer outward-facing functions than other thermostats, thus delivering an emotional experience that reflects the design culture of the company. As CEO Tony Fadell said in an interview published in *Inc.*, "At the end of the day you have to espouse a feeling—in your advertisements, in your products. And that feeling comes from your gut."

Square's mobile app Cash lets you do one thing: send money to a friend. "I think I'm just an editor, and I think every CEO is an editor," wrote Jack Dorsey, Square's CEO. "We have all these inputs, we have all these places that we could go...but we need to present one cohesive story to the world." In organizations like Square, you'll find product leaders saying no much more than they say yes. Rather than chase the market with follow-on features, they lead the market with a constrained focus.

What Types of Companies Are Making This Change?

As industry giants such as IBM and GE realize that software is a fundamental part of their businesses, they are also recognizing the extraordinary levels of complexity they must manage. Design thinking is an essential tool for simplifying and humanizing. It can't be extra; it needs to be a core competence.

"There's no longer any real distinction between business strategy and the design of the user experience," said Bridget van Kralingen, the senior vice president of IBM Global Business Services, in a statement to the press. In November 2013 IBM opened a design studio in Austin, Texas—part of the company's $100 million investment in building a massive design organization. As Phil Gilbert, the general manager of the effort, explained in a press release, "Quite simply, our goal—on a scale unmatched in the industry—is to modernize enterprise software for today's user, who demands great design everywhere, at home and at work." The company intends to hire 1,000 designers.

When I was at the company frog design, GE hired us to help formalize and disseminate language, tools, and success metrics to support its emergent design practice. Dave Cronin, GE's executive design director for industrial internet applications, describes how the company came to realize that it was not just in the business of making physical products but had become one of the largest software providers in the world. The complexity of this software was overwhelming, so his team turned to design. "Our mandate was to create products, but also to enable nimble innovation," Cronin says. "That's a pretty tall order—we were asked to perform design at scale and along the way create cultural change."

IBM and GE are hardly alone. Every established company that has moved from products to services, from hardware to software, or from physical to digital products needs to focus anew on user experience. Every established company that intends to globalize its business must invent processes that can adjust to different cultural contexts. And every established company that chooses to compete on innovation rather than efficiency must be able to define problems artfully and experiment its way to solutions. (For more on the last shift, see "How Samsung Became a Design Powerhouse," page 72.)

The pursuit of design isn't limited to large brand-name corporations; the big strategy-consulting firms are also gearing up for this new world, often by acquiring leading providers of design services. In the past few years, Deloitte acquired Doblin, Accenture acquired Fjord, and McKinsey acquired Lunar. Olof Schybergson, the founder of Fjord, views design thinking's empathetic stance as fundamental to business success. As he told an interviewer, "Going direct to consumers is a big disruptor....There are new opportunities to gather data and insights about consumer behavior, likes, dislikes....Those who have data and an appetite for innovation will prevail." These acquisitions suggest that design is becoming table stakes for high-value corporate consulting—an expected part of a portfolio of business services.

Design thinking is an essential tool for simplifying and humanizing. It can't be extra; it needs to be a core competence.

MARTIN BUCELLA

What Are the Challenges?

Several years ago, I consulted for a large entertainment company that had tucked design away in a select group of "creatives." The company was excited about introducing technology into its theme parks and recognized that a successful visitor experience would hinge on good design. And so it became apparent that the entire organization needed to embrace design as a core competence. This shift is never an easy one. Like many organizations with entrenched cultures that have been successful for many years, the company faced several hurdles.

Accepting more ambiguity. The entertainment company operates globally, so it values repeatable, predictable operational efficiency in support of quarterly profit reporting. Because the introduction of technology into the parks represented a massive capital expenditure, there was pressure for a guarantee of a healthy return. Design, however, doesn't conform easily to estimates. It's difficult if not impossible to understand how much value will be delivered through a better experience or to calculate the return on an investment in creativity.

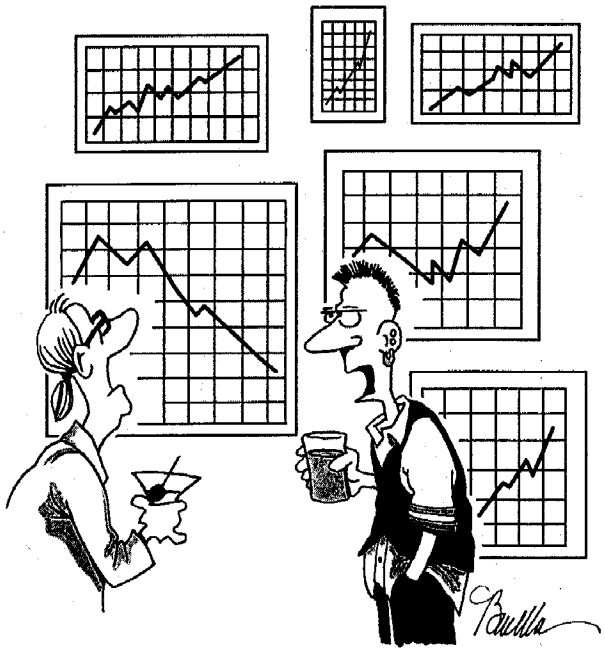
Embracing risk. Transformative innovation is inherently risky. It involves inferences and leaps of faith; if something hasn't been done before, there's no way to guarantee its outcome. The philosopher Charles Peirce said that insights come to us "like a flash"—in an epiphany—making them difficult to rationalize or defend. Leaders need to create a culture that allows people to take chances and move forward without a complete, logical understanding of a problem. Our partners at the entertainment company were empowered to hire a design consultancy, and the organization recognized that the undertaking was no sure thing.

Resetting expectations. As corporate leaders become aware of the power of design, many view design thinking as a solution to all their woes. Designers, enjoying their new level of strategic influence, often reinforce that impression. When I worked with the entertainment company, I was part of that problem, primarily because my livelihood depended on selling design consulting. But design doesn't solve all problems. It helps people and organizations cut through complexity. It's great for innovation. It works extremely well for imagining the future. But it's not the right set of tools for optimizing, streamlining, or otherwise operating a stable business. Additionally, even if expectations are set appropriately, they must be aligned around a realistic timeline—culture changes slowly in large organizations.

AN ORGANIZATIONAL FOCUS on design offers unique opportunities for humanizing technology and for developing emotionally resonant products and services. Adopting this perspective isn't easy. But doing so helps create a workplace where people want to be, one that responds quickly to changing business dynamics and empowers individual contributors. And because design is empathetic, it implicitly drives a more thoughtful, human approach to business.

HBR Reprint R1509D

Jon Kolko is the vice president of design at Blackboard, an education software company; the founder and director of Austin Center for Design; and the author of *Well-Designed: How to Use Empathy to Create Products People Love* (HBR Press, 2014).

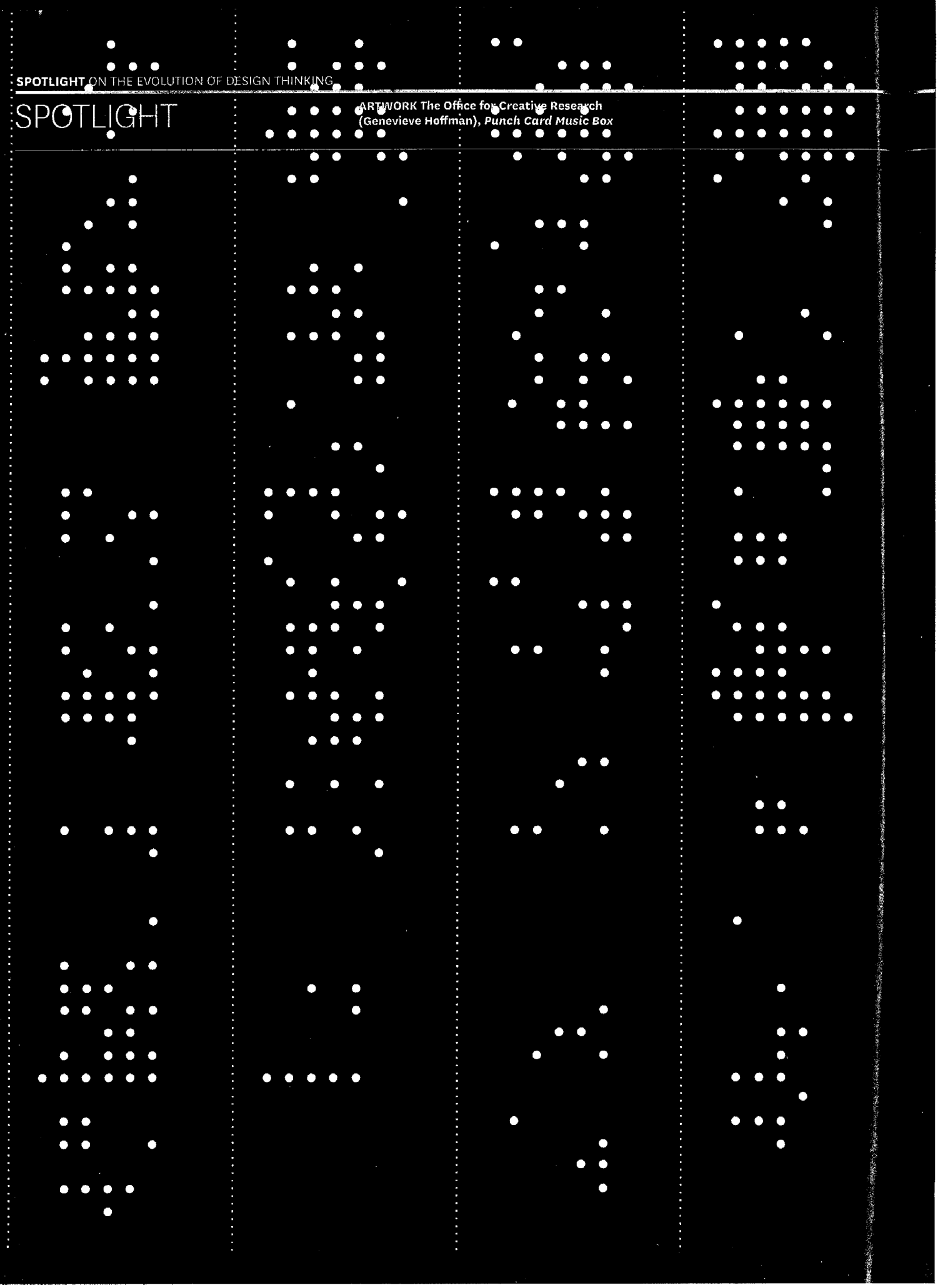


"That's one of my early pieces."

MARTIN BUCELLA

SPOTLIGHT

ARTWORK The Office for Creative Research (Genevieve Hoffman), *Punch Card Music Box*



How Samsung Became a Design Powerhouse

by Youngjin Yoo and Kyungmook Kim

Until 20 years ago,

South Korea's Samsung Electronics manufactured inexpensive, imitative electronics for other companies. Its leaders valued speed, scale, and reliability above all. Its marketers set prices and introduced features according to what original-equipment manufacturers wanted. Its engineers built products to meet prescribed price and performance requirements. At the end of the process designers would "skin" the product—make it look nice. The few designers working for the company were dispersed in engineering and new-product units, and individual designers followed the methods they preferred. In a company that emphasized efficiency and engineering rigor, the designers had little status or influence.

Then, in 1996, Lee Kun-Hee, the chairman of Samsung Group, grew frustrated by the company's lack of innovation and concluded that in order to become a top brand, Samsung needed expertise in design, which he believed would become "the ultimate battleground for global competition in the 21st century." He set out to create a design-focused culture that would support world-class innovation.

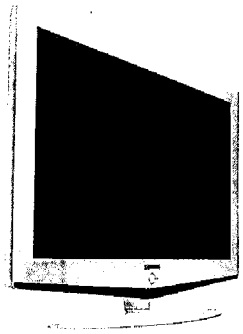
By any measure, his goal was achieved. Samsung now has more than 1,600 designers. Its innovation process begins with research conducted by multidisciplinary teams of designers, engineers, marketers, ethnographers, musicians, and writers who search for users' unmet needs and identify cultural, technological, and economic trends. The company has built an impressive record on design, garnering more awards than any other company in recent years. The bold designs of its televisions often defy conventional style. With its Galaxy Note series, Samsung introduced a new category of smartphone—the phablet—which has been widely copied by competitors. Design is now so much a part of its corporate DNA that top leaders rely on designers to help visualize the future of the entire company.

It has been a bumpy journey. Despite strong support from top management, the company's designers continue to face constant challenges stemming from its efficiency-focused management practices, which are deep-rooted. Shifting to an innovation-focused culture without losing an engineering edge is not a simple matter. It involves managing a number of very real tensions. Engineers and designers sometimes don't see eye-to-eye. Suppliers must be brought on board. Managers invested in the status quo must be persuaded to buy in to idealized visions of the future. A risk-averse culture must learn to accommodate experimentation and occasional failure.

Samsung's success in making this shift can be traced back to a single early decision—to build design competency in-house rather than import it. As we'll describe, Samsung chose to create a committed, resourceful corps of designers who figured out that they could manage the tensions and overcome internal resistance by deploying the same tools that they use in pursuing innovation—*empathy, visualization,* and *experimentation* in the marketplace. The corps has helped institute policies and structures that embed design thinking in all corporate functions and provide a framework for reevaluating products in the face of dramatic technological change.

A DESIGN REVIEW MEETING
at Samsung's Corporate Design Center

BORDEAUX TV
Ethnographic research in 2003 revealed that TVs are off far more than they're on in most homes, so Samsung improved the visual appeal of its TVs starting with this model. It was a huge hit.



COURTESY OF SAMSUNG

Building an In-House Competency

One of the world's biggest technology companies and the leading subsidiary of Samsung Group, Samsung Electronics has been much in the news ever since it branched into consumer electronics and decided to go head-to-head with Apple (whose patent-infringement lawsuits against the company are ongoing). Competition from Apple and others has been intense; in the third quarter of 2014 the company's profits dropped 60% from the same quarter of the previous year. By the first quarter of 2015 profits were recovering but were still below prior-year levels. Nevertheless, the big picture is one of impressive innovation and marketplace success. Samsung's mobile division is the sole survivor of the radical market revolution led by the iPhone

THE CHALLENGE
Samsung Electronics knew that in order to become a top brand, it needed a design-focused culture that would support world-class innovation.

THE PROBLEM
Designers faced constant challenges stemming from the company's efficiency-focused management practices, which were deep-rooted. Managers who were invested in the status quo had to be persuaded to buy in to idealized visions of the future.

THE SOLUTION
The company built a corps of designers with a capacity for strategic thinking and the tenacity that enabled them to overcome resistance by deploying the same tools—empathy, visualization, and market experimentation—that they use in pursuing innovation.

(the mobile divisions of former competitors such as Nokia, Motorola, and Ericsson no longer exist), and smartphone sales drove record earnings for the company in 2013. Moreover, Samsung has been the leader in the global TV market since 2006, generating a series of hit models such as Bordeaux, Touch of Color, One Design, and Curved Smart.

These design leaps all began with Lee's 1996 resolve—triggered in part by a consultant's report on Samsung's innovation deficiencies—to instigate a design "revolution" in the company. (This wasn't the first major leap for Samsung. In 1993 Lee had launched an initiative to integrate Western practices on strategy, HR, merit pay, and design into the conglomerate, but he had been unsatisfied with subsequent progress.) To fuel its design revolution, the company could have sought first-rate expertise from outside. That certainly would have been the fastest approach, and a number of senior managers pushed to have an internationally known Korean designer take over the design function. But other executives persuaded Lee to nurture internal designers who would focus on the company's long-term interests rather than just their own projects.

As part of its investment in developing an organization-wide design capability, Samsung brought in faculty members from a well-known art college and created three training programs. One program trained in-house designers, taking them away from their jobs for as long as two years. (The other two were a college and graduate-level school and an internship program.) Lee made the programs a personal priority, which prevented them from being derailed by the objections of business and design executives who were furious about losing their designers for so long.

Numerous Samsung executives now agree that dependence on outside expertise would have done long-term damage. Developing in-house expertise, while laborious, created a group of designers who take a holistic view. An Yong-Il, the vice president of design strategy, puts it this way: "When we had our own place in the organization, we started caring about the future of the company." The designers also developed a capacity for strategic thinking and a tenacity that enabled them to overcome resistance over the long term. It seems doubtful that any group of outside designers, no matter how brilliant, would have been able to do that—even with support from the chairman.

Empathizing with the Whole Organization

In large companies, the process of innovation is long and tortuous. Even if a design team's new-product concept wins raves and garners executive support, it still must survive numerous downstream decisions—by engineers, programmers, user-experience experts, team leaders, managers, and even, in some cases, suppliers. Each of those decisions creates an opportunity for an idea to be hijacked by other functions' priorities and the strong tendency to steer the process toward the safety of incremental change rather than the risky territory of radical innovation. Kang Yun-Je, a senior vice president and the creative director of Samsung TV, says that nondesign functions typically think they can make good profits simply by using existing technology to make existing products a bit better and a bit faster.

Even in a company that embraces design principles, the reality is that designers must take steps to ensure that their ideas prevail as originally conceived. To do this they need to consistently empathize with decision makers from other functions throughout the process.

COURTESY OF SAMSUNG

Consider, for example, the attempt by Lee Min-Hyouk, Samsung Mobile's creative director, to "sell" what was eventually nicknamed the "Benz phone" after a Norwegian newspaper likened it to the Mercedes-Benz. It was the first flip-cover mobile phone to have no external antenna. Lee, then a junior designer, knew that in order to persuade the engineers to eliminate the antenna, he'd need a better reason than to make a phone look good. To bring them on board, he reached well beyond the usual design role and took on an engineer's mindset, coming up with a new hinge design that created an internal space for a larger and more effective antenna. He also studied different types of paints that would enhance signal reception. "I had to imagine a new design for engineers as well as users," he says. The engineers were won over, and the phone ultimately sold 10 million units.

Design must also win the support of suppliers. If parts makers are unwilling to collaborate, no new design, no matter how compelling it may be, can survive. For example, when Samsung was working on its One Design flat-panel television, it faced strong resistance from its LCD panel supplier, which was accustomed to providing panels with inner covers to protect the components. TV manufacturers would add an external cover, which typically resulted in a thick profile for the final product. Because Samsung's designers envisioned a thin, metal-encased TV, the company wanted the supplier to omit the inner covers.

But "they didn't listen to us," Jung Hyun-Jun, the vice president of engineering for Samsung TV, says of the supplier. "They were selling standardized LCD panels as a complete set to many other TV manufacturers, and they did not see any reason why they should do something different for just one model of one client."

So Samsung's designers, working with its engineers, invented a supply-chain model for LCD panel systems that would radically reduce the shipping cost, because without the covers about 10 times as many LCD cells could be packed into the same space. The cost saving was shared with the supplier, and Samsung got its coverless panels.

Visualizing the Future, Reframing the Problem

Managers are trained to draw on the past and the present to project the future—that's what budget planning is all about. Designers, by contrast, are trained to break from the past. But if they want to persuade decision makers to take a chance on their radical visions of the future, they need to adopt a managerial mindset. Visualization is a powerful tool for bridging the two ways of thinking and getting skeptics to support new ideas.

GALAXY NOTE
Designed in 2011 to address an unmet need for a smartphone that could handle note taking

The development of the Galaxy Note provides a case in point. Soon after Samsung Electronics introduced its Galaxy S smartphone and Galaxy Tab tablet, some members of its design team noticed an unmet need in the market: In Korea and Japan many knowledge workers had a habit of jotting down notes and keep their schedules in wallet-size pocket diaries, for which neither the four-inch phone nor the nine-inch tablet provided a good substitute. Realizing that a whole new platform was needed, the design group developed the concept of a smart diary that featured a pen interface and a five-and-a-half-inch screen.

When the designers introduced the concept to management, fierce debate about the screen size ensued. At the time, the marketers firmly believed that no mobile phone should be larger than five inches. Even after the designers produced mock-ups, managers worried that users would not accept such a large smartphone.

"Although everyone is for innovation, no one wants to change when we start talking about details," says Lee Min-Hyouk, of Samsung Mobile. "People told us, 'It won't sell.' 'You cannot hold it in your hand.' 'How can you put that thing next to your face?' 'The only reason to buy this is to make your face look small.'"

It was clear that the new size would require people's beliefs about smartphones to undergo a fundamental shift. The team was able to prevail by reframing the conversation: It prepared a mock-up of the product demonstrating what eventually became the widely imitated "smart cover," which connects with the user-experience software to display an interactive screen when the cover is closed. The mock-up looked more like a pocket diary, and those present at the design review realized that when it was thought of in that way, the new phone did not look so big. This shift in perception allowed Samsung to create the phablet category, which led to the highly successful Galaxy Note series. The company now uses the smart-cover concept for the smaller Galaxy S series as well.

DESIGN FOR THE NEAR AND DISTANT FUTURE

Separate design teams at Samsung focus on different definitions of the "future," from near-term to far-term, so that the flow of ideas will be sustainable indefinitely.

DESIGNERS IN BUSINESS UNITS	COMBINATION BUSINESS UNIT & CORPORATE DESIGNERS		CORPORATE DESIGN CENTER
LINE-UP DESIGN **12 MONTHS OUT** Designers in business units shape the company's offerings by • Developing new products and user interfaces • Conducting a competitive analysis of new and existing products	**ARCHETYPE DESIGN** **18–24 MONTHS OUT** Designers in business units, with the help of the Corporate Design Center, create product and platform archetypes by • Planning for specific new products • Designing new products and user interfaces • Investigating details such as colors and materials	**NEXT-GENERATION DESIGN** **2–5 YEARS OUT** Designers in the CDC, in collaboration with business-unit designers, help senior executives shape the company's near-term future by • Developing a new business investment plan • Creating a next-generation platform road map • Investigating new enabling technologies	**FUTURE DESIGN** **5–10 YEARS OUT** Designers in the CDC help the C-suite visualize the company's distant future by • Developing new business concepts • Creating a technology road map • Investigating technology and user megatrends

Experimenting in the Marketplace

Empathy and visualization aren't always enough to generate the internal support necessary for radical change. In some cases Samsung designers experiment and refine their ideas in the marketplace and use the market data to build support.

Around 2003, Samsung's designers wanted to improve the aesthetics of the company's TVs. This grew out of an initiative to question the very definition of a television. Ethnographic research revealed that in most homes, TVs are off far more hours than they're on. In other words, much of the time they are pieces of furniture. As such, the designers felt, sets should be visually stunning. They proposed removing the speakers from their usual location, on either side of the screen, and hiding them. This radical design alteration would require a trade-off on audio quality, but the designers believed that a fundamental change had occurred in consumers' thinking about TV sound. Because so many people were connecting their sets to home-theater systems, their thinking went, audio quality was no longer a priority and could safely be compromised. Accordingly, they hid the speakers below the screen, creating downward-facing speaker holes that would direct sound to the unit's graceful, chevron-shaped bottom edge, where it would be reflected toward the viewer.

Many Samsung managers were skeptical. They still believed the conventional wisdom about TV design: that, in descending order, the priorities were visual quality, audio quality, usability, and physical shape. The CEO was concerned about the idea of putting speakers below the screen, says Kim Young-Jun, a design SVP. To build consensus, the design group urged the company to experiment with the idea in the European market. The model was a big hit, and the CEO and the entire TV development team, including marketers and engineers, backed the concept. Bolstered by the experiment's success, the design group chose an even more daring design for what became the Bordeaux model, with a glossy white border and a red chevron-shaped lower edge. When the full line of products finally came out, Samsung sold a million units in six months.

Samsung has also learned to use marketplace experimentation to support forward-looking design research. After one team's folding-screen concept generated a rapid share increase in the PC-monitor market, the team found it easier to secure funding for other long-term design initiatives. It was able to develop and launch a series of highly successful products in the TV market. All Samsung's recent hit models have their origins in such a process.

With commercial successes like these to the designers' credit, the value of advance design is now widely appreciated within the company, and Samsung has made substantial investments in deep-future thinking. In fact, four distinct time horizons now exist simultaneously for design within Samsung. (See the exhibit "Design for the Near and Distant Future.")

Creating a Sustainable—and Flexible—Design Organization

Internal resistance has been a fact of life at Samsung ever since the company started on the road to

"I had to imagine a new design for engineers as well as users."

—a design executive who made an aesthetic change to a mobile phone

design excellence, 20 years ago. In the late 1990s An Yong-Il, the design strategy VP, met strong opposition from Samsung managers when, after studying the design organizations of companies such as IBM, Sony, Mitsubishi, Panasonic, and Phillips, he recommended adoption of a companywide design philosophy described as "Inspired by humans, creating the future." Executives made it very clear that meeting short-term profit targets by selling cheap imitations of competitors' products was more important to them than establishing a design philosophy. Even designers gave An's philosophy a lukewarm reception. He says, "About 20% agreed with what I said but did not want to do it. About 50% said, 'Why bother? We just draw pretty pictures as told by others.' It was only about 30% of designers, mostly young, who were interested."

So it's perhaps not surprising that during the Asian financial crisis of 1997, the company cut back on its design initiatives. Discouraged, An considered leaving the company. His boss urged him to enter a PhD program instead, to study management and organizational design and to reflect on what would ensure a strong future for design thinking at Samsung.

His studies brought An to the conclusion that design philosophy and design principles must be visualized through clear organizational structures and processes and a new personnel policy. The design group should include people who understood social science, ethnography, engineering, and management. In 2000, when Samsung emerged from the financial crisis, An's boss worked with the company's corporate strategy office to conduct a strategic review of the design organization. The review found that Samsung needed to establish a strategic design group, later dubbed the Corporate Design Center, that would plan for the company's future and lead the way in perpetuating its emphasis on design thinking. Today the CDC is organized around twice-yearly strategic design review meetings that involve all the company's senior executives. The most crucial element of those meetings is visualizing Samsung's future.

The importance of design is felt everywhere. In the TV division, for example, engineers will tell you that their primary job is to help designers realize their vision. When sales of the Galaxy S series declined recently, it was design that received the most scrutiny from corporate leaders.

Nevertheless, Samsung faces enormous challenges going forward. Its approach to design is still largely based on the development of hardware products, even though most of that hardware runs on software. As digital technology changes the business landscape—and as Samsung continues to develop its own operating system and various service platforms in transportation, health, and payments—the company will have to radically alter its design process. Designers are already experimenting with agile development for software-based user-interface designs that require frequent rapid iterations and shorter design cycles. They are trying various forms of cross-functional coordination as they deal with increasingly convergent products. Recently Samsung conducted the first companywide design-management capability review, which is being used to inform a corporate restructuring. The company's design revolution is far from complete.

As the technological landscape continues to shift, executives of all corporations that seek an advantage through design thinking will need to constantly review their design processes, cultures, decision making, communications, and strategy. Recognizing that Lee Min-Hyouk's comment "Although everyone is for innovation, no one wants to change when we start talking about details" applies even to design groups, companies must push the usual bounds of design thinking and create an ever more radical vision for the future.

HBR Reprint R1509E

Youngjin Yoo is the Harry A. Cochran Professor in Management Information Systems and the founding director of the Center for Design+Innovation at Temple University. He is also an overseas advisory fellow of the Samsung Economic Research Institute and consults for Samsung Electronics. **Kyungmook Kim** is a principal designer at Samsung Electronics' Corporate Design Center.

How Indra Nooyi Turned Design Thinking Into Strategy

"A well-designed product is one you fall in love with."

JUST A FEW years ago, it wasn't clear whether Indra Nooyi would survive as PepsiCo's CEO. Many investors saw Pepsi as a bloated giant whose top brands were losing market share. And they were critical of Nooyi's shift toward a more health-oriented overall product line. Prominent activist investor Nelson Peltz fought hard to split the company in two.

These days Nooyi, 59, exudes confidence. The company has enjoyed steady revenue growth during her nine years in the top job, and Pepsi's stock price is rising again after several flat years. Peltz even agreed to a truce in return for a board seat for one of his allies.

All of this frees Nooyi to focus on what she says is now driving innovation in the company: design thinking. In 2012 she brought in Mauro Porcini as Pepsi's first-ever chief design officer. Now, Nooyi says, "design" has a voice in nearly every important decision that the company makes. (See the sidebar "How Design Can Thrive.")

To understand Pepsi's transformation, I spoke with Nooyi at the company's temporary headquarters in White Plains, New York (the real one, in Purchase, is being renovated). She talked about what design means to her, the challenges in changing a culture, and her proudest achievement.

—Adi Ignatius

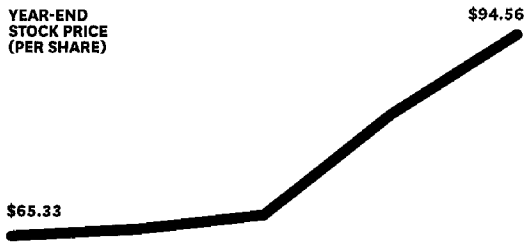
HBR: What problem were you trying to solve by making PepsiCo more design-driven?
Nooyi: As CEO, I visit a market every week to see what we look like on the shelves. I always ask myself—not as a CEO but as a mom—"What products really speak to me?" The shelves just seem more and more cluttered, so I thought we had to rethink our innovation process and design experiences for our consumers—from conception to what's on the shelf.

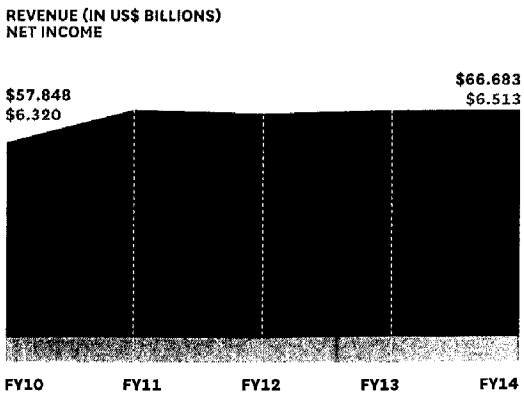
How did you begin to drive that change? First, I gave each of my direct reports an empty photo album and a camera. I asked them to take pictures of anything they thought represented good design.

What did you get back from them? After six weeks, only a few people returned the albums. Some had their wives take pictures. Many did nothing at all. They didn't know what design was. Every time I tried to talk about design within the company, people would refer to packaging: "Should we go to a different blue?" It was like putting lipstick on a pig, as opposed to redesigning the pig itself. I realized we needed to bring a designer into the company.

PepsiCo Financials

FOUNDED 1965 (Pepsi-Cola and Frito-Lay merger)
HEADQUARTERS Purchase, New York
EMPLOYEES 271,000





SOURCES *WALL STREET JOURNAL* HISTORICAL STOCK QUOTES AND PEPSICO ANNUAL REPORTS

How easy was it to find Mauro Porcini? We did a search, and we saw that he'd achieved this kind of success at 3M. So we brought him in to talk about our vision. He said he wanted resources, a design studio, and a seat at the table. We gave him all of that. Now our teams are pushing design through the entire system, from product creation, to packaging and labeling, to how a product looks on the shelf, to how consumers interact with it.

What's your definition of good design? For me, a well-designed product is one you fall in love with. Or you hate. It may be polarizing, but it has to provoke a real reaction. Ideally, it's a product you want to engage with in the future, rather than just "Yeah, I bought it, and I ate it."

You say it's not just about packaging, but a lot of what you're talking about seems to be that. It's much more than packaging. We had to rethink the entire experience, from conception to what's on the shelf to the postproduct experience. Let's take Pepsi Spire, our new touchscreen fountain machine. Other companies with dispensing machines have focused on adding a few more buttons and combinations of flavors. Our design guys essentially said that we're talking about a fundamentally different interaction between consumer and machine. We basically have a gigantic iPad on a futuristic machine that talks to you and invites you to interact with it. It tracks what you buy so that in the future, when you swipe your ID, it reminds you of the flavor combinations you tried last time and suggests new ones. It displays beautiful shots of the product, so when you add lime or cranberry, it actually shows those flavors being added—you *experience* the infusion of the flavor, as opposed to merely hitting a button and out comes the finished product.

Have you developed other notable design-led innovations? We're working on new products for women. Our old approach was "shrink it or pink it." We'd put Doritos, say, in a pink Susan G. Komen bag and say it's for women. That's fine, but there's more to how women like to snack.

OK, how *do* women like to snack? When men finish a snack bag, they pour what's left into their mouths. Women don't do that. And they worry about how much the product may stain—they won't rub it on

PREVIOUS SPREAD: EMIR UZUN

a chair, which a lot of guys do. In China, we've introduced a stacked chip that comes in a plastic tray inside a canister. When a woman wants to snack, she can open her drawer and eat from the tray. When she's done, she can push it back in. The chip is also less noisy to eat: Women don't want people to hear them crunching away.

Basically, you're paying a lot more attention to user experience. Definitely. In the past, user experience wasn't part of our lexicon. Focusing on crunch, taste, and everything else now pushes us to rethink shape, packaging, form, and function. All of that has consequences for what machinery we put in place—to produce, say, a plastic tray instead of a flex bag. We're forcing the design thinking way back in the supply chain.

To what extent do you listen to consumers? Do they even know what they want? I don't know if consumers know what they want. But we can learn from them. Let's take SunChips. The original size was one inch by one inch. When you'd bite into a chip, it would break into pieces. In focus groups consumers told us they went to another product because it was bite-size. We had to conclude that SunChips were too damn big. I don't care if our mold can only cut one inch by one inch. We don't sell products based on the manufacturing we have, but on how our target consumers can fall in love with them.

Launch and Failure

When I picture design thinking, I think about rapid prototyping and testing. Is that part of what you're trying to do? Not so much in the U.S., but China and Japan are lead horses for that process—test, prove, launch. If you launch quickly, you have more failures, but that's OK because the cost of failure in those markets is low. In the U.S., we tend to follow very organized processes and then launch. The China-Japan model may have to come to the U.S. at some point.

Isn't this model already established in the U.S., or at least in Silicon Valley? Lots of small companies take this approach, and for them the cost of failure is acceptable. We're more cautious, especially when playing with big brands. Line extensions are fine: If you launch a flavor of Doritos that doesn't work, you just pull it. But if you launch a new product, you want to make sure you've tested it enough. In Japan, we launch a new version of Pepsi every three months—green, pink, blue. We just launched cucumber-flavored Pepsi. In three months it either works or we pull it and go to the next product.

Read more advice from Mauro Porcini at **HBR.org**.

Is your design approach giving Pepsi competitive advantage? We have to do two things as a company: Keep our top line growing in the mid single digits, and grow our bottom line faster than the top. Line extensions keep the base growing. And then we're always looking for hero products—the two or three big products that will drive the top line significantly in a particular country or segment. Mountain Dew Kickstart is one of those. It's a completely different product: higher juice content, fewer calories, new

How Design Can Thrive

Mauro Porcini, PepsiCo's first-ever chief design officer, oversees design-led innovation across all of PepsiCo's brands. He describes a step-by-step approach to embedding design thinking in a company's culture.

Certain circumstances are necessary for design to thrive in enterprises. First, you have to bring in the right kind of design leaders. That's where many organizations make mistakes. If design is really about deeply understanding people and then strategizing accordingly, we need design leaders with broad skills. Corporate executives often don't understand that there are different kinds of design: brand design, industrial design, interior design, UX (user experience) design, design innovation, and more. So, you need a leader with a holistic vision who can manage all aspects of design in a very smart way.

Second, you need the right sponsorship from the top. The new design function and the new culture must be protected by the CEO or by somebody else at the executive level—because any entity, any organization, is apt to resist change.

Third, with leadership and C-suite sponsorship in place, you need as many external endorsements as possible—from a variety of entities. They might come from business leaders or designers outside your organization, from design and business magazines, or from awards you win. Whatever the sources, those endorsements validate the vision of the people inside your organization, showing them that they're moving in the right direction and building their confidence to proceed.

Then you need quick wins: projects that rapidly prove the value of design inside the enterprise. On the basis of that early success, you start to build a design organization, to create processes that facilitate the new culture, and to craft an approach that can be integrated throughout the whole company.

PREVIOUS SPREAD: EMIR UZUN

flavors. We thought about this innovation differently. In the past we just would have created new flavors of Mountain Dew. But Kickstart comes in a slim can and doesn't look or taste like the old Mountain Dew. It's bringing new users into the franchise: women who say, "Hey, this is an 80-calorie product with juice in a package I can walk around with." It has generated more than $200 million in two years, which in our business is hard to do.

Is this an example of design thinking, or just part of the innovation process? There's a fine line between innovation and design. Ideally, design leads to innovation and innovation demands design. We're just getting started. Innovation accounted for 9% of our net revenue last year. I'd like to raise that to the mid teens, because I think the marketplace is getting more creative. To get there, we'll have to be willing to tolerate more failure and shorter cycles of adaptation.

"Now our teams are pushing design through the entire system."

Do you feel that companies have to reinvent themselves every few years, that competitive advantage is fleeting? No question about it. It's been a long time since you could talk about sustainable competitive advantage. The cycles are shortened. The rule used to be that you'd reinvent yourself once every seven to 10 years. Now it's every two to three years. There's constant reinvention: how you do business, how you deal with the customer.

Managing Change

How do you bring everyone in the company along with what sounds like a dramatic change in approach? The most important thing was finding the right person in Mauro. Our beverage people immediately embraced how he could help us think about product design and development. Then retailers fell in love with him and started inviting him to their shops to talk about how to reset their shelves. Mauro's team grew from about 10 people to almost 50, and we set him up in Soho in New York City. Now our products look like they're tailored to the right cohort groups, and our packaging looks pretty damn good, too.

How do you push the culture change throughout the company? In the past, being decentralized was our strength, but also our weakness. It's a fine approach when the whole world is growing and life is peachy. But it doesn't work when things are volatile globally and you need coordination. We've given our people 24 to 36 months to adapt. I told everyone that if they don't change, I'd be happy to attend their retirement parties.

How do you measure whether or not people are making it? We watch how they act in our global meetings and whether they include design early in the process. We see how much innovation, influenced by design, is being put into the market. We maintain an aggressive productivity program to take costs out and free up resources. You have to squeeze as much as you can out of every dollar, and we watch how many costs are coming out.

Purpose and the Portfolio

You often use the term "purpose" in talking about your business. What does that mean to you? When I became CEO in 2006, I did a series of town hall meetings with employees. Few said they came to work for a paycheck. Most wanted to build a life, not simply gain a livelihood. And they were well aware that consumers cared about health and wellness. We realized we needed to engage our people's heads, hearts, and hands. We had to produce more products that are good for you. We had to embrace sustainability. Purpose is not about giving money away for social responsibility. It's about fundamentally changing how to make money in order to deliver performance—to help ensure that PepsiCo is a "good" company where young people want to work.

Would you be willing to accept lower profit margins to "do the right thing"? Surely, there have to be trade-offs. Purpose doesn't hurt margins. Purpose is how you drive transformation. If you don't transform the portfolio, you're going to stop top-line growth, and margins will decline anyway. So we don't really invest in "purpose," but in a strategy to keep the company successful in the future. If we hadn't tackled certain environmental issues,

especially with water, we would have lost our licenses in some countries. Now, sometimes when you're changing the culture radically, you run into problems. Transformations sometimes hit your margins or top line because things don't always go in a straight line. But if you think in terms of the life span of the company, these are just small blips.

But aren't you still selling a lot of unhealthy products? We make a portfolio of products, some of which are "fun for you" and some of which are "good for you." We sell sugary beverages and chips, but we also have Quaker Oats, Tropicana, Naked Juice, and Izze. We're reducing the salt, sugar, and fat in the core products. And we've dialed up the good-for-you offerings because societal needs have changed.

Would you consider stopping a popular product line because it doesn't meet the good-for-you standard? That wouldn't make sense, because none of our products is bad or unsafe. We give consumers choices that reflect their lifestyles. If you want to consume Pepsi, we'll give you Pepsi in every size possible so that on one occasion you can consume 12 ounces and on another only seven and a half. We want to make sure that both the good-for-you and the fun-for-you products are readily available, affordably priced, and great tasting. And we make sure that good-for-you tastes as good as fun-for-you. We want you to love our Quaker Oats Real Medleys as much as you love Doritos Loaded.

Do you try to push sales of the healthier products? Yes, but we also want to preserve choice. We've taken lessons from Richard Thaler and Cass Sunstein's book *Nudge*. We try to put portion-control packages out front on the shelves. We make sure our diet products are merchandised as aspirationally as our full-sugar products are. We advertise Gatorade only with athletes in mind because it's not intended to be a recreational beverage.

Consumers seem very demanding these days. How do you keep up with that? We have to make sure we're engineering our portfolio for the consumer of the future. There's nothing wrong, for example, with aspartame. But if consumers say they don't like it, we have to give them a choice. We'll offer a diet product that's aspartame-free. Similarly, there's nothing wrong with high-fructose corn syrup, but if consumers say they like real sugar, we have to offer that, too.

PepsiCo's Billion-Dollar Brands

BEVERAGES

Pepsi
Mountain Dew
Gatorade
Tropicana
Diet Pepsi
7UP
Mirinda
Lipton
Aquafina
Pepsi Max
Brisk
Sierra Mist
Diet Mountain Dew
Starbucks ready-to-drink beverages

FOOD

Lay's
Doritos
Quaker
Cheetos
Ruffles
Tostitos
Fritos
Walkers Crisps

SOURCE PEPSICO FY14 ANNUAL REPORT

What's your proudest accomplishment since becoming CEO? I took over PepsiCo just after it had a string of successful years. Then everything changed. We faced new regulatory pressures on our fun-for-you categories, and our good-for-you business wasn't fully developed. The North American market slowed down, and we weren't big enough internationally. Sales through some major U.S. customers slowed down massively. Our key beverage competitor had done a big reset of its own, and it bounced back. We looked at ourselves and saw a decentralized, far-flung company that had to be knitted together. The culture needed to change. We had to eliminate redundancies. We had to slim down to reinvest in R&D, advertising and marketing, and new capabilities. I had a choice. I could have gone pedal to the metal, stripped out costs, delivered strong profit for a few years, and then said adios. But that wouldn't have yielded long-term success. So I articulated a strategy to the board focusing on the portfolio we needed to build, the muscles we needed to strengthen, the capabilities to develop. The board said, "We know there will be hiccups along the way, but you have our support, so go make it happen." We started to implement that strategy, and we've delivered great shareholder value while strengthening the company for the long term.

Growing up in Madras, you seem to have broken every possible stereotypical expectation of a young girl in India. Are you still that person? To a certain extent. When you're a CEO, you can't break too many stereotypical expectations. I wish you could, but you can't. In those days, there was a well-defined conservative stereotype, so everything I did was breaking the framework. I played in a rock band. I climbed trees. I did stuff that made my parents wonder, "What the hell is she doing?" But I also was a good student and a good daughter, so I never brought shame on the family. And I was lucky that the men in my family thought the women should have an equal shot at everything. I'm still a bit of a rebel, always saying that we cannot sit still. Every morning you've got to wake up with a healthy fear that the world is changing, and a conviction that, to win, you have to change faster and be more agile than anyone else.

HBR Reprint R1509F