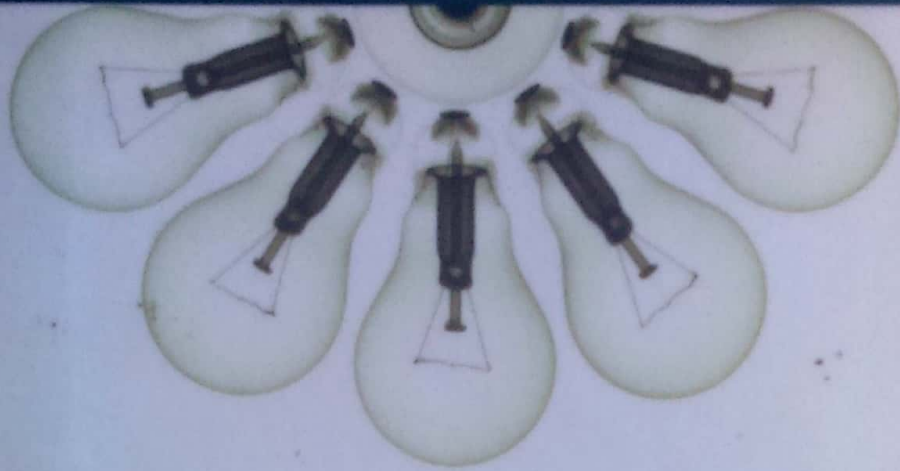


Lessons in Creativity from IDEO,  
America's Leading Design Firm

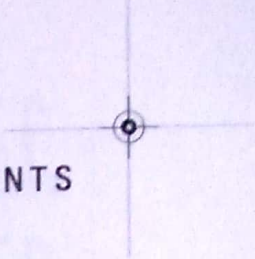


# The Art of Innovation

Tom Kelley

with Jonathan Littman

foreword by Tom Peters



## CONTENTS

FOREWORD BY TOM PETERS xi

- 1 INNOVATION AT THE TOP 1
- 2 WINGING IT IN START-UP MODE 15
- 3 INNOVATION BEGINS WITH AN EYE 23
- 4 THE PERFECT BRAINSTORM 53
- 5 A COOL COMPANY NEEDS HOT GROUPS 67
- 6 PROTOTYPING IS THE SHORTHAND OF INNOVATION 101
- 7 BUILD YOUR GREENHOUSE 119
- 8 EXPECT THE UNEXPECTED 147
- 9 BARRIER JUMPING 163
- 10 CREATING EXPERIENCES FOR FUN AND PROFIT 193
- 11 ZERO TO SIXTY 219

12 COLORING OUTSIDE THE LINES 229

13 IN SEARCH OF THE "WET NAP" INTERFACE 253

14 LIVE THE FUTURE 275

15 GETTING IN THE SWING 291

INDEX 299

and managers loved the cart and even said that with a couple of modifications, they'd want one. We took the afternoon off to celebrate and get ready to return to our regular clients.

The cart was done, the show was aired, and we thought that was pretty much the end of it. But the morning after the *Nightline* segment ran, our phones wouldn't stop ringing. I took dozens of calls from executives around the country who'd seen the show. Most of them didn't give a damn about shopping carts. Instead, they wanted to know more about the process we used to bring the cart into being. One CEO told me that he understood, for the first time, what creativity really meant and how it could be managed in a business environment.

*Nightline's* Deep Dive broadcast was among its most popular of the year, so popular in fact that the network rebroadcast it a few months later. The response amazed us. But maybe it shouldn't have. The fact is, everybody talks about creativity and innovation, but not many people perform the feats without a safety net in front of a nationwide television audience.

## BUILDING IN CREATIVITY AND INNOVATION

Why should business care about creativity? Visit your local mall or trade show and you'll see that creativity sells. We're all searching for the next iMac or VW Beetle—any worthwhile innovation that captures the public's imagination and strengthens the company's brand. But many companies shy away from novel solutions. Moreover, they tend to believe that truly creative individuals are few and far between. We believe the opposite. *We all* have a creative side, and it can flourish if you spawn a culture to encourage it, one that embraces risks and wild ideas and tolerates the occasional failure. We've seen it happen.

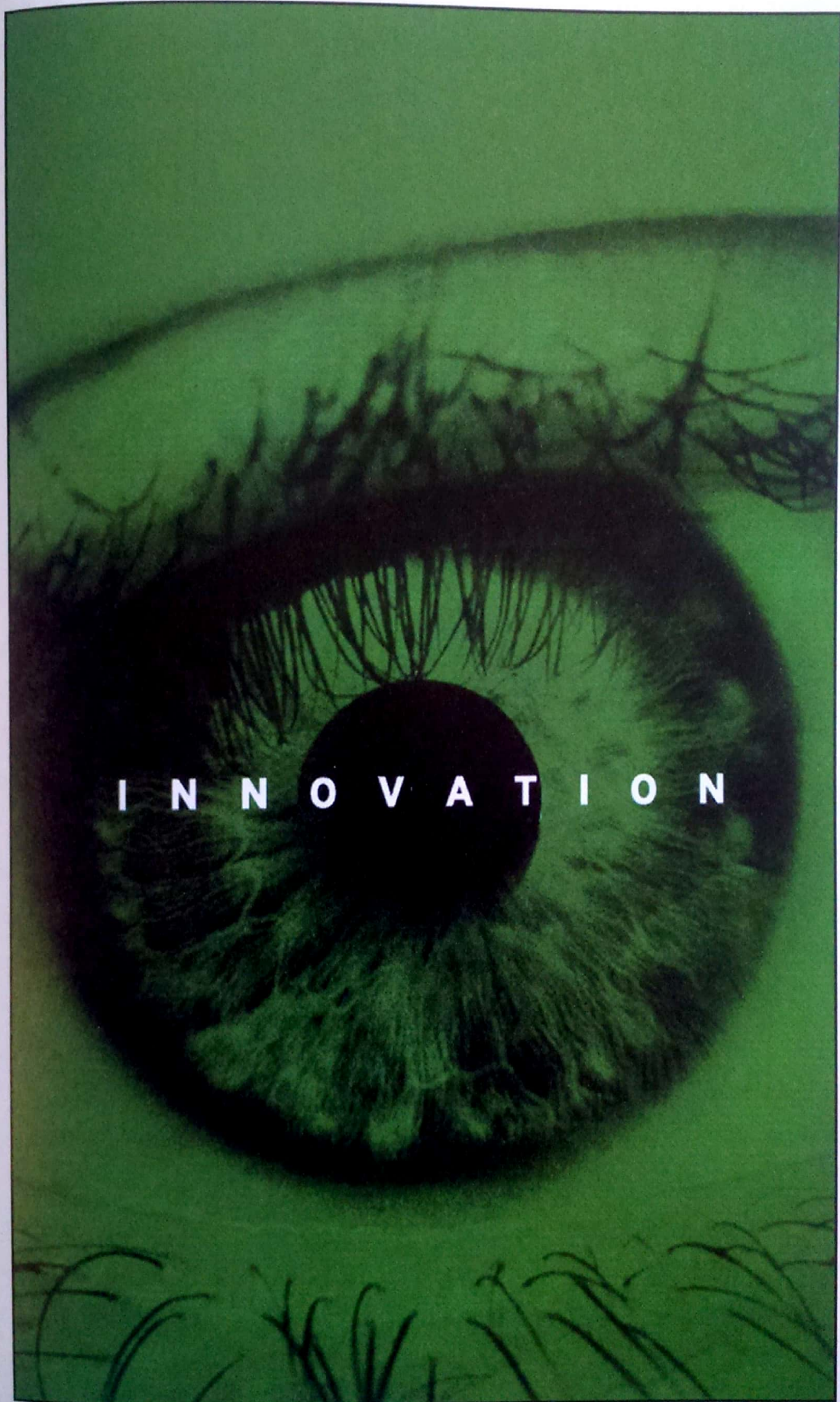
The more we thought about the success of the *Nightline* Deep Dive,

the more it made sense to distill what we've learned in the trenches from hundreds of corporations on thousands of projects. This book aims to demystify the creative process. It isn't something we dreamed up in a business school class. It's been tried and tested through hands-on experience. It helped IDEO grow from a two-person office into the leading product design firm in the world.

It can help you too.

INNOVATION BEGINS  
WITH AN EYE

3



What do stand-up toothpaste tubes, all-in-one fishing kits, high-tech blood analyzers, flexible office shelves, and self-sealing sports bottles have in common? Nothing actually, except that they're all IDEO-designed products that were inspired by watching real people.

We're not big fans of focus groups. We don't much care for traditional market research either. We go to the source. Not the "experts" inside a company, but the actual people who use the product or something similar to what we're hoping to create.

Plenty of well-meaning clients duly inform us what a new product needs to do. They already "know" how people use their products. They're so familiar with their customers and existing product line that they can rattle off half a dozen good reasons why an innovation is impractical. Of course, we listen to these concerns. Then we get in the operating room, so to speak, and see for ourselves.

A few years back, for example, Silicon Valley-based Advanced Cardiovascular Systems asked us to help it redesign a critical medical instrument used on heart patients during balloon angioplasty. The company sold an inflation device for the tiny balloon that the doctor inserts with a catheter through the femoral artery in a patient's leg. The balloon is guided up into the obstructed coronary artery and inflated, compressing the plaque and stretching the artery. ACS told us that the new inflation device—like the existing one—had to be suitable for one-handed use.

But when we went into the operating room—literally—that's not what we saw. Although the current product could theoretically be used with one hand, it really worked that way only if you had a hand the size of Michael Jordan's. In actual practice, medical technicians almost always used *both* hands with the device, since, as we observed, they weren't doing anything else with their "spare" hand. So why not design

the new “Indeflator,” we thought, for a two-handed technician? Why fight human instinct?

It’s precisely this sort of observation-fueled insight that makes innovation possible. Uncovering what comes naturally to people. And having the strength to change the rules. From the simple observation that technicians used *both* hands flowed distinct improvements. We added ribs to the base of the pumplike device so that technicians could hold it steady in one hand while they inflated the balloon with the other hand. We tilted the pressure gauge upward so that it was easy to read during inflation. We increased control and precision. We made it easier to deflate the balloon too. And we made one other big change.

There’s a critical moment in an angioplasty procedure when the surgeon instructs a technician to inflate the balloon. During the next sixty seconds or so, the balloon obstructs the artery, creating, in effect, a heart attack. At that point, with the patient still awake, the old device would make a loud clicking noise as it ratcheted into place.

Our new design lost that scary ratcheting sound.

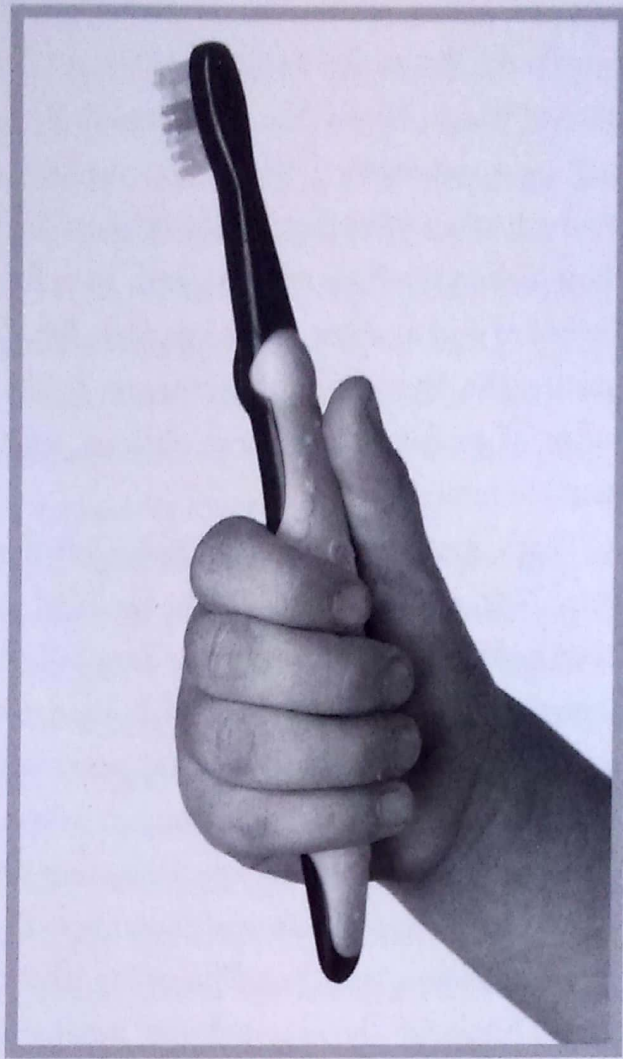
## TIME IN THE JUNGLE

Clicks-and-mortar brokerage founder Charles Schwab has talked about his effort to assume the perspective of his customers. “I am like a chef. I like to taste the food. If it tastes bad, I don’t serve it. I’m constantly monitoring what we do, and I’m always looking for better ways we can provide financial services, ways that would make me happy if I were a client.”

Noble aspirations, and you can’t argue with Schwab’s track record, but we believe you have to go beyond putting yourself in your customers’ shoes. Indeed, we believe it’s not even enough to *ask* people what they think about a product or idea.

One reason is the same factor that prevents you from learning that





Steven Moeder

Observations helped us discover that smaller hands actually need fatter toothbrushes.

## INSPIRATION BY OBSERVATION

Open your eyes and you'll be awakened to opportunities to improve products and services without even leaving your office. Walking around Bank of America's corporate headquarters in 1989 on a project called Objects for a Better Day at Work, we saw something we hadn't expected. Desks, computers, monitors, and keyboards were state-of-the-art but still didn't allow much leeway for physical differences. If

you weren't the "ideal user," you usually had to jury-rig your setup to fit your body. But in the heart of corporate America, we hadn't expected piles of phone books. We first thought it was another storage problem but soon determined that some workers at the bank were placing phone books under their desks because they couldn't comfortably rest their feet on the floor when seated. To achieve the right height for their keyboard and monitor, their legs were left dangling. It seems like a minor insight. But seeing those phone books firsthand helped inspire a range of products, the most obvious, of course, being a simple adjustable footrest.

That's another example of "being left-handed." Not everybody's like you. Not everybody reads the manual or follows directions. Not everybody is a thirty-year-old six-foot-tall white male. Awaken your antenna to the endless variety of human nature, and you're bound to make customers happier and find new markets.

Baxter Healthcare, for instance, asked us to help create a user-centered design for a very special system that helps patients with heart disease. Known as a left ventricular assist system, it's a life-critical device that keeps your heart pumping while you're waiting for a transplant. Although the external unit weighs only a few pounds, that can still be a burden when you consider that the patient using it may be in a weakened state. So we prototyped and observed, looking for a better way to carry the unit. We tried backpacks and vests. In the end, we discovered that a strap around the waist made it easier for the user to interact with the device. And we designed some simple audible tones that would let people know if the battery was running low.

There's an urgency to medical products. Sometimes the right design can be a matter of life or death.

EXPECT THE UNEXPECTED

8



Tim Davis/Stone



History teaches that innovation does not come about by central planning. If it did, Silicon Valley would be nearer to Moscow than to San Francisco. Working on thousands of projects has taught us a simple but critical element that every team or company should come to expect: the unexpected.

Chance offers insights you didn't anticipate. It's a well-accepted truth that inventions and discoveries often result from random accidents or experiments that went awry.

How can you capitalize on that phenomenon? Well, you can start by expecting the unexpected, being open to surprises from sources within and outside your organization.

Try approaching projects with humility and the knowledge that answers may come from places you least suspect. We call this "looking cross-eyed" and "cross-pollination." It's quite liberating and powerful. If you expect to find answers from unusual places, it's far more likely to happen. In nature, we know that cross-pollination leads to superior strains of plants. It's the same with products and services. Launch a project with the assumption that cross-pollination may help you to innovate, and you're more likely to be ready to take the leaps of creativity necessary for innovation.

Now that we're midstream in the innovation process, I think it's appropriate to issue a disclaimer. We don't know it all. Neither does your boss or even the CEO. Accidents happen. Here follow some of my experiences and insights about how it is that serendipity plays a critical role in innovation—and what you can do about this puzzling variable.

## BALANCING UNPREDICTABILITY

Growing up near Akron, I had “Ohio history” classes that included the story of Procter & Gamble’s fabulously successful Ivory soap. It began with a blunder: an ordinary worker who went to lunch and accidentally left a mixing machine running with a batch of soap inside. When he came back, the mix had been whipped to a froth, with soap so light that it floated. By chance, the new floating Ivory proved to be both convenient and popular, marketed by P&G as “99 and 44 one-hundredths percent pure.” A factory worker stumbled onto a new way of mixing soap, but it was P&G’s marketing group that seized the opportunity to create one of the most successful packaged goods of the twentieth century.

Chance has played a role in all kinds of breakthroughs, from science to technology and business. Velcro started when a Swiss mountaineer returned from a hike covered with prickly cockleburs. A little observation under the microscope yielded the reason—nature’s tiny hooks, perfect for grabbing a ride in the feathers or fur of passing creatures. *Voilà!* Soon the French were making Velcro’s artificial hooks and loops that stick and easily separate. People had been plagued with prickly burrs from the beginning of recorded history. It took an intellectually curious person with access to the right tools to turn the idea into a breakthrough material. Stop and think for a moment. Are you proactively hiring the intellectually curious? If so, what tools do they need to help them along?

Saccharin was discovered in 1879 when a research fellow at Johns Hopkins University found his bread extra sweet one night and figured that something from the lab must have followed him home. Incredibly, he set about to tasting nearly everything in his lab—and lived to find o-benzoic sulfimide—saccharin by any other name. Chance not only favors the trained mind, but in this case, it favored a man brave enough to lick everything in sight till he could trace the source of his discovery.

## UNEXPECTED UPS AND DOWNS

Successful companies have the agility to turn small failures or anomalies like these into big successes. Unfortunately, the reverse can also occur. Even after two decades of watching our clients' products rise and fall, we occasionally bet on the wrong horse. Sometimes it seems that guessing which product will fly is a little like picking the classmate most likely to succeed. Two that really fooled me were Dynabook and Momenta.

I wasn't the only one who thought the Dynabook laptop computer looked like a winner. It was one of our sleekest portable designs, a black cast-magnesium computer that looked ahead of its time. Dynabook Technologies even had backing from blue-chip venture capitalists at Kleiner Perkins who had a stellar track record of sensing "the right stuff." But there was one thing Dynabook hadn't planned for—Intel coming up with a new chip. Just when Intel 386 chips were becoming available, Dynabook introduced its 286 machine. All the good looks and well-integrated features in the world couldn't carry an old chip around the block.

In the same way, Momenta was one of the handful of IDEO clients I was ready to invest in from the very beginning. Headed by the charismatic Kamran Elahian, the company seemed to have both history and money on its side. Kamran had a great track record and so much sway with venture capitalists that he was turning away money. And the company's marketing campaign was smart. It focused on what Momenta's pen-based computer would do for real people—along the lines of our "verbs not nouns" approach—and had a captivating "Thousand Days to Greatness" program to motivate the internal development team. Momenta spent nearly \$3 million in marketing on the day of the product's unveiling alone to make sure that the world noticed its product launch.

We'd already worked on just about every other hope-springs-eternal pen-based gizmo in the Valley—the GRiDPad, the PalmPad, the Go PenPoint machine and its spin-off, the EO. But Momenta was a powerful computer and—to me—seemed to have an aura of success about

it from the very beginning. In retrospect, maybe it was trying to do too much; its large, high-resolution touch screen was expensive; its handwriting recognition wasn't quite there yet. This much I know for certain: Momenta went on to become one of the most glorious flameouts in Silicon Valley history.

### GOOD TIMING DOESN'T HURT

Over the years I've noticed some patterns. Products that become hits seem to enjoy a balance of features, price, and that often elusive element of timing. And lightning can strike for what on the surface seems a humble product. We've designed plenty of computer monitors over the years, for instance, but our most successful monitor is one of our most understated. The "Simply Samsung" SyncMaster monitors have sold in the millions of units, more than any other monitors we've designed. It may not always make headlines, but good design at an affordable price sells.

Some products seem to be blessed with perfect timing and sizing. The Polaroid I-Zone camera was one of our more ambitious projects (we did extensive observations with kids to find out what they found "cool"). Still, I wasn't sure that the postage-stamp-sized photo stickers that had been so successful in Japan would catch on in the United States. Yet in the last few months of 1999, it became the best-selling camera in America. Why? Though there's long been strong demand for Polaroid cameras, the market was partly constrained by the fact that you needed a fairly bulky camera to develop a reasonable-sized print. But since the I-Zone prints tiny pictures, the camera itself can be kid-sized. And it turned out that the smaller pictures provided a tremendous opportunity—they're ideal for sticking inside a school locker or on a notebook. In a nutshell, the I-Zone translated the instant gratifi-

## ADVANCE PRAISE FOR *THE ART OF INNOVATION*

"Tom Kelley has unlocked the magic box of innovation for corporate America. At a time when creativity and innovation are the driving forces for the New Economy, Kelley shows how IDEO does it—and how companies everywhere can learn to build the products and services we all crave. If you're trying to create product lust, *The Art of Innovation* shows you how to do it."

—BRUCE NUSSBAUM, *BUSINESS WEEK*

"Everyone talks about innovation and creativity, but IDEO has actually done it. *The Art of Innovation* provides detailed, actionable ideas about how to build an innovative culture and an organization that makes creativity seem routine. Its well-placed emphasis on management practices makes it a great read for anyone in any organization who wants to get better at what they do."

—JEFFREY PFEFFER, PROFESSOR, STANFORD BUSINESS SCHOOL,  
AND AUTHOR OF *THE KNOWING-DOING GAP*

## WHAT THE WORLD HAS BEEN SAYING ABOUT IDEO

"IDEO Product Development is the world's most celebrated design firm. Its ultimate creation is the process of creativity itself. For founder David M. Kelley and his colleagues, work is play, brainstorming is a science, and the most important rule is to break the rules....Can this formula for creativity work in other places? Some of the world's leading companies certainly think so."

—*FAST COMPANY*

"One of the hottest product development firms on the planet."

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