into a harmonious balance. The next generation of designers will need to be as comfortable in the boardroom as they are in the studio or the shop, and they will need to begin looking at every problem—from adult illiteracy to global warming—as a *design* problem.

CHAPTER TWO

converting need into demand,
or *putting people first*

Several years ago, during the research phase for a project on office telephone systems, we interviewed a travel agent who had developed a startlingly effective "workaround" for making conference calls. Rather than contend with her company's impossibly complicated phone system, she simply dialed each party on a separate telephone and arrayed the receivers around her desk—"Judy" in Minneapolis was on her left; "Marvin" in Tampa was on her right; and together the three of them figured out a complicated travel itinerary. The software engineers who labored over the interface would have probably resorted to the standard lament: "RTFM"—"Read the (ahem) Manual." For design thinkers, however, behaviors are never right or wrong, but they are always meaningful.

The job of the designer, to borrow a marvelous phrase from Peter Drucker, is "converting need into demand." On the face of it, this sounds simple: just figure out what people want and then give it to them. But if it's so easy, why don't we see more success stories like the iPod? The Prius? MTV and eBay? The answer, I'd suggest, is that we need to return human beings to the center of the story. We need to learn to put people first.

Much has been written about "human-centered design" and its importance to innovation. Since there are so few truly compelling stories, however, it's time to ask why it is so difficult to spot

a need and design a response. The basic problem is that people are so ingenious at adapting to inconvenient situations that they are often not even aware that they are doing so: they sit on their seat belts, write their PINs on their hands, hang their jackets on doorknobs, and chain their bicycles to park benches. Henry Ford understood this when he remarked, "If I'd asked my customers what they wanted, they'd have said 'a faster horse.'" This is why traditional techniques such as focus groups and surveys, which in most cases simply ask people what they want, rarely yield important insights. The tools of conventional market research can be useful in pointing toward incremental improvements, but they will never lead to those rule-breaking, game-changing, paradigm-shifting breakthroughs that leave us scratching our heads and wondering why nobody ever thought of them before.

Our real goal, then, is not so much fulfilling manifest needs by creating a speedier printer or a more ergonomic keyboard; that's the job of designers. It is helping people to articulate the latent needs they may not even know they have, and this is the challenge of *design thinkers.* How should we approach it? What tools do we have that can lead us from modest incremental changes to the leaps of insight that will redraw the map? In this chapter I'd like to focus upon three mutually reinforcing elements of any successful design program. I'll call them *insight, observation, and empathy.*

insight: learning from the lives of others

Insight is one of the key sources of design thinking, and it does not usually come from reams of quantitative data that measure

exactly what we already have and tell us what we already know. A better starting point is to go out into the world and observe the actual experiences of commuters, skateboarders, and registered nurses as they improvise their way through their daily lives. The psychologist Jane Fulton Suri, one of the pioneers of human factors research, refers to the myriad "thoughtless acts" people perform throughout the day: the shopkeeper who uses a hammer as a doorstop; the office worker who sticks identifying labels onto the jungle of computer cables under his desk. Rarely will the everyday people who are the consumers of our products, the customers for our services, the occupants of our buildings, or the users of our digital interfaces be able to tell us what to do. Their actual behaviors, however, can provide us with invaluable clues about their range of unmet needs.

Design is a fundamentally creative endeavor, but I do not mean this in an arcane or romantic sense. In an analytical paradigm, we simply solve for the missing number (though anyone who struggled, as I did, through high school algebra knows how daunting this can be!). In a *design* paradigm, however, the solution is not locked away somewhere waiting to be discovered but lies in the creative work of the team. The creative process generates ideas and concepts that have not existed before. These are more likely to be triggered by observing the odd practices of an amateur carpenter or the incongruous detail in a mechanic's shop than by hiring expert consultants or asking "statistically average" people to respond to a survey or fill out a questionnaire. The insight phase that helps to launch a project is therefore every bit as critical as the engineering that comes later, and we must take it from wherever we can find it.

The evolution from *design* to *design thinking* is the story of

the evolution from the creation of products to the analysis of the relationship between people and products, and from there to the relationship between people and people. Indeed, a striking development of recent years has been the migration of designers toward social and behavioral problems, such as adhering to a drug regimen or shifting from junk food to healthy snacking. When the Centers for Disease Control and Prevention approached IDEO with the challenge of addressing the epidemic of obesity among children and teens, we seized the opportunity to apply these qualitative research practices to a problem where we might have real social impact. In search of insight, a team of human factors experts called Jennifer Portnick at Feeling Good Fitness in San Francisco.

Jennifer had nurtured the dream of becoming a Jazzercise dance instructor but at a full-figured size 18 she ran up against the company's requirement that franchisees project "a fit appearance." She countered that "fit" and "large" are not incompatible and persisted through a legal challenge that won international attention and led Jazzercise to drop its weight-discriminatory policy. Portnick's story has been inspiring to countless people—of all sizes and both sexes—who have faced discrimination on account of acquired or inherited characteristics. It was inspiring to design thinkers, however, on different grounds. Because she flourished on the margins of the bell curve, she was in a position to help the design team frame the problem in a new and insightful way. To begin with the assumption that all fat people want to be thin, that weight is inversely proportional to happiness, or that large size implies lack of discipline is to prejudge the problem.

The single example of Jennifer Portnick gave the project team more insight into the problem of youth obesity than reams of statistics. And the easiest thing about the search for insight—in contrast to the search for hard data—is that it's everywhere and it's free.

observation: watching what people don't do, listening to what they don't say

Walk into the offices of any of the world's leading design consultancies, and the first question is likely to be "Where is everybody?" Of course, many hours are spent in the model shop, in project rooms, and peering into computer monitors, but many more hours are spent out in the field with the people who will ultimately benefit from our work. Although grocery store shoppers, office workers, and schoolchildren are not the ones who will write us a check at the end of a project, they are our ultimate clients. The only way we can get to know them is to seek them out where they live, work, and play. Accordingly, almost every project we undertake involves an intensive period of observation. We watch what people do (and do not do) and listen to what they say (and do not say). This takes some practice.

There is nothing simple about determining whom to observe, what research techniques to employ, how to draw useful inferences from the information gathered, or when to begin the process of synthesis that begins to point us toward a solution. As any anthropologist will attest, observation relies on quality, not quantity. The decisions one makes can dramatically affect

the results one gets. It makes sense for a company to familiarize itself with the buying habits of people who inhabit the center of its current market, for they are the ones who will verify that an idea is valid on a large scale—a fall outfit for Barbie, for instance, or next year's feature on last year's car. By concentrating solely on the bulge at the center of the bell curve, however, we are more likely to confirm what we already know than learn something new and surprising. For insights at that level we need to head for the edges, the places where we expect to find "extreme" users who live differently, think differently, and consume differently—a collector who owns 1,400 Barbies, for instance, or a professional car thief.

Hanging out with obsessives, compulsives, and other deviants can be unnerving, though it certainly makes life interesting. Fortunately, it's not always necessary to go quite to these extremes. A few years ago, when the Swiss company Zyliss engaged IDEO to design a new line of kitchen tools, the team started out by studying children and professional chefs—neither of whom were the intended market for these mainstream products. For that very reason, however, both groups yielded valuable insights. A seven-year-old girl struggling with a can opener highlighted issues of physical control that adults have learned to disguise. The shortcuts used by a restaurant chef yielded unexpected insights into cleaning because of the exceptional demands he placed on his kitchen tools. The exaggerated concerns of people at the margins led the team to abandon the orthodoxy of the "matched set" and to create a line of products united by a common design language but with the right handle for each tool. As a result, Zyliss whisks, spatulas, and pizza cutters continue to fly off the shelves.

the behavioral turn

Although most people can train themselves to become sensitive, skilled observers, some firms have come to rely upon seasoned professionals who guide every stage of this process; indeed, a striking feature of design practice today is the number of highly trained social scientists who have opted for careers outside academia. A few economists entered the government after World War I and a trickle of sociologists ventured into the private sector in the wake of World War II, but they were always regarded by their former academic colleagues with misgivings. Today, however, some of the most imaginative research in the behavioral sciences is being sponsored by companies that take design thinking seriously.

At Intel's campus in Beaverton, Oregon, a high-powered team of researchers led by Maria Bezaitis uses observational tools refined in academic social science to study a range of issues that will affect the company's business not at the end of the current quarter but in ten years: the future of digital money; how teenage girls use technology to protect their privacy; patterns of street life in the emerging multinational metropolis; the burgeoning community of people who live in "extreme homes" such as RVs. The psychologists, anthropologists, and sociologists in Bezaitis's People and Practices Research Group have fanned out around the globe in search of insights into cultural transformations that may or may not remain local phenomena. Why is a Silicon Valley chip maker interested in sponsoring a bunch of renegade social scientists to study people and practices in eastern Europe or western Africa? Because today only about 10 percent of the world's

population has access to networked communications technology. Intel knows that it will have to be ready when "the next 10 percent" comes online.

Other industry leaders are no less committed to the principle of extracting insights from observations and using them to inspire future product offerings. Nokia's worldwide research is supported by the innovative ethnographic techniques developed by Jan Chipchase, an anthropologist who conducts "exploratory human behavioral field research" from his home base in Tokyo. Chipchase and his group believe that they have glimpsed the future in phenomena ranging from the morning bicycle commute across Ho Chi Minh City to the items people carry in Helsinki, Seoul, and Rio de Janeiro to the sharing of cell phones in Kampala, Uganda. The vast range of observations Chipchase and his colleagues have collected, together with the insights culled from them, will inform Nokia's future product offerings over the next three to fifteen years. Such work is fundamentally different from trendspotting, coolhunting, and seasonal market research.

There are professional affinities between academic social scientists and those who work in industry—they hold the same degrees, read the same journals, and attend the same conferences—but there are also differences. Academics are typically motivated by a scientific objective, whereas researchers such as Bezaitis and Chipchase are more attuned to the long-term practical implications of their findings. The next stage along this continuum is represented by a new breed of ethnographer who works within the compressed time frame of a project. In contrast to the isolated theorizing of individual academics or the clustering of social scientists in the research units of Intel

or Nokia, these people work best when they are integrated into cross-disciplinary project teams that may include designers, engineers, and marketers. Their shared experiences will become essential sources of idea generation throughout the life of the project.

I have had many opportunities to observe this model of ethnographic practice among my colleagues at IDEO. In a project for an NGO called The Community Builders, the largest nonprofit developer of low- and mixed-income public housing in the United States, we assembled a team consisting of an anthropologist, an architect, and a human factors specialist. Together they interviewed builders, planners, and municipal authorities, and local entrepreneurs and service providers, but did not stop there. The real insights happened when the team arranged to stay overnight with three families at different income levels and with different life trajectories who lived in Park Duvalle, a mixed-income community in Kentucky.

This approach became even more salient on a subsequent project in which the team was trying to develop a tool kit to help NGOs implement human-centered design to meet the needs of subsistence farmers in Africa and Asia. This time, together with their partners from International Development Enterprises, they arranged overnight stays in farming villages in Ethiopia and Vietnam. Over time they were able to build a level of trust among people who might have been justifiably wary of visiting anthropologists or aid officials arriving in shiny SUVs, and this led in turn to a climate of honesty, empathy, and mutual respect.

Although the behavioral science researchers at places such

as Intel, Nokia, and IDEO are trained professionals, there are times when it makes sense to "deputize" our clients and enlist them in the hard work of conducting observations themselves. We thought nothing of putting a pocket-size notebook into the hands of Alan G. Lafley, the CEO of Procter & Gamble, and sending him out shopping for records on Berkeley's colorful Telegraph Avenue. Lafley is famous for his impatience with CEOs who are content to peer down upon the world from the executive suite or from the smoked-glass windows of a corporate limousine and for his willingness to venture out into the places where his customers live, work, and shop. This perspective is surely the basis of his widely reported pronouncement that "mass marketing is dead."

On other occasions, it is our clients themselves who take the lead and provide cues as to where we might look for insight. In the course of a project on emergency room care, undertaken with the Institute for Healthcare Improvement and the Robert Wood Johnson Foundation, a member of the IHI group reported on his experience at the Indianapolis 500. A smoking racecar pulled into a pit stop where a precision team of trained professionals, with state-of-the-art tools at the ready, assessed the situation and performed all the necessary repairs within seconds. Change a few words around, and you have an accurate description of a hospital trauma center. Of course, we also looked at real emergency room environments and observed physicians and nurses at work, but observing "analogous" situations—a pit stop at the Indy 500, a neighborhood fire station, an elementary school playground during recess—will often jolt us out of the frame of reference that makes it so difficult to see the larger picture.

empathy: standing in the shoes (or lying on the gurneys) of others

It's possible to spend days, weeks, or months conducting research of this sort, but at the end of it all we will have little more than stacks of field notes, videotapes, and photographs unless we can connect with the people we are observing at a fundamental level. We call this "empathy," and it is perhaps the most important distinction between academic thinking and design thinking. We are not trying to generate new knowledge, test a theory, or validate a scientific hypothesis—that's the work of our university colleagues and an indispensable part of our shared intellectual landscape. The mission of design thinking is to translate observations into insights and insights into products and services that will improve lives.

Empathy is the mental habit that moves us beyond thinking of people as laboratory rats or standard deviations. If we are to "borrow" the lives of other people to inspire new ideas, we need to begin by recognizing that their seemingly inexplicable behaviors represent different strategies for coping with the confusing, complex, and contradictory world in which they live. The computer mouse developed at Xerox PARC in the 1970s was an intricate technical apparatus invented by engineers and intended for engineers. To them it made perfect sense that it should be taken apart and cleaned at the end of the day. But when the fledgling Apple Computer asked us to help it create a computer "for the rest of us," we gained our first lesson in the value of empathy.

A designer, no less than an engineer or marketing executive, who simply generalizes from his own standards and ex-

pectations will limit the field of opportunity. A thirty-year-old man does not have the same life experiences as a sixty-year-old woman. An affluent Californian has little in common with a tenant farmer living on the outskirts of Nairobi. A talented, conscientious industrial designer, settling down at her desk after an invigorating ride on her mountain bike, may be ill prepared to design a simple kitchen gadget for her grandmother who is suffering from rheumatoid arthritis.

We build these bridges of insight through *empathy*, the effort to see the world through the eyes of others, understand the world through their experiences, and feel the world through their emotions. In 2000, Robert Porter, the president and CEO of the SSM DePaul Health Center in Saint Louis, approached IDEO with a vision. Porter had seen the episode of ABC's *Nightline* in which Ted Koppel had challenged us to redesign the American shopping cart *in one week* and wanted to discuss the implications of our process for a new wing of the hospital. But we had a vision too, and we saw an opportunity for a new and radical "codesign" process that would join designers and health care professionals in a common effort. We challenged ourselves by starting with what is perhaps the most demanding of all hospital environments: the emergency room.

Drawing upon his highly specialized expertise in the ethnographic study of technology and complex systems, Kristian Simsarian, one of the core team members, set out to capture the patient experience. What better way to do so than to check into the hospital and go through the emergency room experience, from admission to examination, as if he were a patient? Feigning a foot injury, Kristian placed himself into the shoes—and in fact, onto the gurney—of the average emergency room patient. He saw firsthand how disorienting the check-in process could be. He experienced the frustration of being asked to wait, without ever being told what he was waiting for or why. He endured the anxiety of being wheeled by an unidentified staffer down an anonymous corridor through a pair of intimidating double doors and into the glare and the din of the emergency room.

We have all had those kinds of first-person, first-time experiences—buying our first car, stepping out of the airport in a city we have never visited, evaluating assisted living facilities for an aging parent. In these situations we look at everything with a much higher level of acuity because nothing is familiar and we have not fallen into the routines that make daily life manageable. With a video camera tucked discreetly beneath his hospital gown, Kristian captured a patient's experience in a way that no surgeon, nurse, or ambulance driver could possibly have done.

When Kristian returned from his undercover mission, the team reviewed the unedited video and spotted numerous opportunities for improving the patient experience. But there was a larger discovery. As they sat through minute after tedious minute of acoustic ceiling tiles, look-alike hallways, and featureless waiting areas, it became increasingly evident that these details, not the efficiency of the staff or the quality of the facilities, were key to the new story they wanted to tell. The crushing tedium of the video thrust the design team into Kristian's—and, by extension, the patient's—experience of the opacity of the hospital process. It triggered in each of them the mix of boredom and anxiety that comes with being in a situation in which one feels lost, uninformed, and not in control.

The team realized that two competing narratives were in play: The hospital saw the "patient journey" in terms of insurance verification, medical prioritization, and bed allocation. The patient experienced it as a stressful situation made worse. From this set of observations the team concluded that the hospital needed to balance its legitimate concerns with medical and administrative tasks with an empathic concern for the human side of the equation. This insight became the basis of a far-reaching program of "codesign" in which IDEO's designers worked with DePaul's hospital staff to explore hundreds of opportunities to improve the patient experience.

Kristian's visit to the emergency room exposed a layered picture of a patient's experience. At the most obvious level, we learned about his physical environment: we can see what he sees and touch what he touches; we observe the emergency room as an intense, crowded place that provides patients with few cues as to what is going on; we feel the cramped spaces and the narrow hallways and note both the structured and improvised interactions that take place within them. We may infer that the emergency room facilities—not unreasonably, perhaps—are designed around the requirements of the professional staff rather than the comfort of the patient. Insights lead to new insights as seemingly insignificant physical details accumulate.

A second layer of understanding is less physical than cognitive. By experiencing the patient journey firsthand, the team gained important clues that might help it to translate insight into opportunity. How does a patient make sense out of the situation? How do new arrivals navigate the physical and social space? What are they likely to find confusing? These questions are essential to identifying what we call *latent* needs, needs

that may be acute but that people may not be able to articulate. By achieving a state of empathy with anxious patients checking into an emergency room (or weary travelers checking into a Marriott hotel or frustrated passengers checking in at an Amtrak ticket counter), we can better imagine how the experience might be improved. Sometimes we use these insights to emphasize the new. At other times it makes sense to do just the opposite, to reference the ordinary and the familiar.

Cognitive understanding of the ordinary and the familiar was at work when Tim Mott and Larry Tesler, working on the original graphical user interface at Xerox PARC in the 1970s, proposed the metaphor of the desktop. This concept helped move the computer from a forbidding new technology of value only to scientists to a tool that could be applied to office and even household tasks. It was still in evidence three decades later, when the start-up Juniper Financial asked IDEO to help it think about whether banks still needed buildings, vaults, and tellers.

In approaching the uncharted territory of online banking, we began by trying to get a better understanding of how people thought about their money. This exercise proved to be challenging in the extreme since we can't watch the *cognitive* process of someone thinking about money in the way we can watch the *behavioral* process of someone paying a bill or withdrawing cash from an ATM. The team settled on the technique of asking selected participants to "draw their money"—not the credit cards in their wallets or the checkbooks in their purses but the way in which money played a part in their lives. One participant—we called her "The Pathfinder"—drew little Monopoly-style houses representing her family, her 401(k) retirement plan, and some rental properties,

since her focus was on long-term security. Another participant—designated "The Onlooker"—drew a picture with a pile of money on one side and a pile of goods on the other. With disarming candor, she explained to the team, "I get money and I buy stuff." The Onlooker was completely focused on her day-to-day financial situation and did almost no planning for the future. Beginning from cognitive experiments like these, the team of researchers, strategists, and designers developed a subtle market analysis that helped Juniper refine its target market and build an effective service in the emerging world of online banking.

A third layer—beyond the functional and the cognitive—comes into play when we begin working with ideas that matter to people at an emotional level. Emotional understanding becomes essential here. What do the people in your target population feel? What touches them? What motivates them? Political parties and advertising agencies have been exploiting people's emotional vulnerabilities for ages, but "emotional understanding" can help companies turn their customers not into adversaries but into advocates.

The Palm Pilot was an indisputably clever invention, and it has, deservedly, won widespread acclaim. Jeff Hawkins, its creator, began with the insight that the competition for a small, mobile device was not the omnifunctional laptop computer but the simple paper diary that many of us still slip into and out of our shirt pockets or purses a hundred times a day. When he began to work on the Palm in the mid-1990s, Jeff decided to buck the conventional wisdom and create a product that did *less* than was technically possible. That his software engineers could have stuffed spreadsheet capabilities, colorful graphics, and a garage-door opener into the Palm didn't matter. Better

to do a few things well, so long as they were the *right* things: a contact list, a calendar, and a to-do list. Period.

The first version of the Palm PDA was a hit among tech-savvy early adopters, but there was nothing about its chunky gray plastic form that fired the imaginations of the larger public. In search of this elusive quality, Jeff teamed up with Dennis Boyle at IDEO, and together they began to work on a redesign that would appeal not just at a *functional* but also at an *emotional* level. The interface was left largely unchanged, but the physical quality of the device—designers call it the "form factor"—was reimagined. First, it was to be thin enough that it would slide smoothly into a pocket or purse—if it didn't disappear, Dennis sent his team back to the drawing boards. Second, it was to have a feel that was sleek, elegant, and sophisticated. The team sought out an aluminum-stamping technique used by Japanese camera manufacturers and found a rechargeable power supply that even the battery suppliers doubted would work. The added development was worth the effort. The Palm V went on sale in 1999, and sales rocketed to more than 6 million. It opened up the market for the handheld PDA not because of a lower price point, added functionality, or technical innovation. The elegant Palm V did everything it promised to do, but its sophisticated look and professional feel appealed, at an emotional level, to a whole new set of consumers.

beyond the individual

If we were interested only in understanding the individual consumer as a psychological monad, we could probably stop here;