Change by Design
How Design Thinking Transforms Organizations and Inspires Innovation

THE SUMMARY IN BRIEF

The myth of innovation is that brilliant ideas leap fully formed from the minds of geniuses. In reality, most innovations are born from rigor and discipline. Breakthrough ideas — whether for a new bicycle, an advertising campaign, a treatment plan for diabetes or a program aimed at tackling the national obesity epidemic — emerge not by chance, but by studying and embracing the immediate challenges we encounter every day in our offices and homes, laboratories and hospitals, classrooms and conference rooms, and in all the spaces in between. We don’t simply realize solutions; we design them.

Change by Design introduces readers to design thinking. Design is not just about creating elegant objects or beautifying the world around us. The best designers match necessity to utility, constraint to possibility, and need to demand. These design thinkers rely on rigorous observations of how we use spaces and the objects and services that occupy them; they discover patterns where others see complexity and confusion; they synthesize new ideas from seemingly disparate fragments; and they convert problems into opportunities. Design thinking is a method in which genius, in the end, is not required.

IN THIS SUMMARY, YOU WILL LEARN:

• How to apply design thinking to abstract, multifaceted problems.
• How design thinking can be applied to address a wide range of issues and concerns.
• How to confront the challenges of today in order to create the opportunities of tomorrow.
• How design thinking has the potential to create meaningful change.
Introduction: The Power of Design Thinking

Today, rather than enlist designers to make an already developed idea more attractive, the most progressive companies are challenging them to create ideas at the outset of the development process. The former role is tactical; it builds on what exists and usually moves it one step further. The latter is strategic; it pulls “design” out of the studio and unleashes its disruptive, game-changing potential. It’s no accident that designers can now be found in the boardrooms of some of the world’s most progressive companies. As a thought process, design has begun to move upstream.

Moreover, the principles of design thinking turn out to be applicable to a wide range of organizations, not just to companies in search of new product offerings. A competent designer can always improve upon last year’s new widget, but an interdisciplinary team of skilled design thinkers is in a position to tackle more complex problems. From pediatric obesity to crime prevention to climate change, design thinking is now being applied to a range of challenges that bear little resemblance to the covetable objects that fill the pages of today’s coffee-table publications.

The causes underlying the growing interest in design are clear. As the center of economic activity in the developing world shifts inexorably from industrial manufacturing to knowledge creation and service delivery, innovation has become nothing less than a survival strategy. It is, moreover, no longer limited to the introduction of new physical products but includes new sorts of processes, services, interactions, entertainment forms and ways of communicating and collaborating. These are exactly the kinds of human-centered tasks that designers work on every day. The natural evolution from design doing to design thinking reflects the growing recognition on the part of today’s business leaders that design has become too important to be left to designers.

What Is Design Thinking?

The nature of design thinking makes it impossible to create a simple, easy-to-follow recipe that would ensure that every project ends successfully. Design thinkers know that there is no “one best way” to move through the process. There are useful starting points and helpful landmarks along the way, but the continuum of innovation is best thought of as a system of overlapping spaces rather than a sequence of orderly steps. We can think of them as inspiration, the problem or opportunity that motivates the search for solutions; ideation, the process of generating, developing and testing ideas; and implementation, the path that leads from the project room to the market. Projects may loop back through these spaces more than once as the team refines its ideas and explores new directions.

The reason for the iterative, nonlinear nature of the journey is not that design thinkers are disorganized or undisciplined but that design thinking is fundamentally an exploratory process; done right, it will invariably make unexpected discoveries along the way, and it would be foolish not to find out where they lead. Often these discoveries can be integrated into the ongoing process without disruption. At other times the discovery will motivate the team to revisit some of its most basic
assumptions. While testing a prototype, for instance, consumers may provide insights that point to a more interesting, more promising and potentially more profitable market opening up. Insights of this sort should inspire us to refine or rethink our assumptions rather than press onward in adherence to an original plan. This approach should be seen not as a system reset but as a meaningful upgrade.

Open-Ended, Open-Minded and Iterative

Insofar as it is open-ended, open-minded and iterative, a process fed by design thinking will feel chaotic to those experiencing it for the first time. But over the life of a project, it invariably comes to make sense and achieves results that differ markedly from the linear, milestone-based processes that define traditional business practices. In any case, predictability leads to boredom and boredom leads to the loss of talented people. It also leads to results that rivals find easy to copy. It is better to take an experimental approach: Share processes, encourage the collective ownership of ideas and enable teams to learn from one another.

A second way to think about the overlapping spaces of innovation is in terms of boundaries. To an artist in pursuit of beauty or a scientist in search of truth, the bounds of a project may appear as unwelcome constraints. But the mark of a designer, as the legendary Charles Eames often said, is a willing embrace of constraints.

The willing and even enthusiastic acceptance of competing constraints is the foundation of design thinking. The first stage of the design process is often about discovering which constraints are important and establishing a framework for evaluating them. Constraints can best be visualized in terms of three overlapping criteria for successful ideas: feasibility (what is functionally possible within the foreseeable future), viability (what is likely to become part of a sustainable business model) and desirability (what makes sense to people and for people).

A competent designer will resolve each of these three constraints, but a design thinker will bring them into a harmonious balance.

Converting Need Into Demand

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 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.

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.

Elements of a Successful Design Program

There are three mutually reinforcing elements of any successful design program: 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 the 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.

• Observation: watching what people don’t do, listening to what they don’t say. Almost every project undertaken by the best design thinkers involves an intense period of observation. They watch what people do (and do not do) and listen to what they say (and do not say). This takes some practice. Observation relies on quality, not quantity.

• Empathy: standing in the shoes of others. It’s possible to spend days, weeks or months conducting research, 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. The mission of design thinking is to translate observations into insights and insights into products and services that will improve lives.

The movement from insight to observation to empathy leads us finally, to the most intriguing question of them all: If cultures are so diverse and if the 20th-century image of “the unruly mob” has given way to the 21st-century discovery of “the wisdom of crowds,” how can we tap that collective intelligence to unleash the full power of design thinking? We need to invent a new and radical form of collaboration that blurs the boundaries between creators and consumers. It’s not about “us versus them” or even “us on behalf of them.” For the design thinker, it has to be “us with them.”

A Mental Matrix

Today companies like Google and 3M are renowned for encouraging scientists and engineers to spend up to 20 percent of their time on personal experiments.

A tolerance for risk taking has as much to do with the culture of an organization as with its business strategy. Some would argue that a climate of open-ended exploration encourages a profligate waste of resources. In an organization that encourages experimentation, there will be projects destined to go nowhere and still others that the keepers of institutional memory prefer not to talk about. But to view such initiatives as “wasteful,” “inefficient” or “redundant” may be a symptom of a culture focused on efficiency over innovation and a company at risk of collapsing into a downward spiral of incrementalism.

It’s no accident that designers in recent years have been following the emerging science of bio-mimicry — the idea that nature, with its 4.5-billion-year learning curve, may have something to teach us about things such as nontoxic adhesives, minimal structures, efficient thermal insulation or aerodynamic streamlining. The bewildering variety at work in a healthy ecosystem is nothing but an exercise in sustained experimentation — try something new, and see what sticks. It may well be that we need to begin mimicking nature not just at the molecular level but at the systemic level of companies and organizations. An excess of experimental zeal would be risky — companies do not enjoy the luxurious time frame of biological systems, and their leaders would be remiss if they chose not to exercise what might be called (with apologies to Darwin) “intelligent design.” What is called for is a judicious blend of bottom-up experimentation and guidance from above.

The Rules of Experimentation

The rules for this approach are as simple to state as they are challenging to apply:

1. The best ideas emerge when the whole organizational ecosystem — not just its designers and engineers and certainly not just management — has room to experiment.
2. Those most exposed to changing externalities (new technology, shifting consumer base, strategic threats or opportunities) are the ones best placed to respond and most motivated to do so.
3. Ideas should not be favored based on who creates them.
4. Ideas that create a buzz should be favored. Indeed, ideas should gain a vocal following, however small, before being given organizational support.
5. The “gardening” skills of senior leadership should be used to tend, prune and harvest ideas. MBAs call this “risk tolerance.” We call it the top-down bit.
6. An overarching purpose should be articulated so that the organization has a sense of direction and innovators don’t feel the need for constant supervision.

These rules apply to almost every field of innovation. Together they ensure that the seeds of individual creativity take root.

Building to Think

Since openness to experimentation is the lifeblood of any creative organization, prototyping — the willingness to go ahead and try something by building it — is the best evidence of experimentation. We may think of a prototype as a finished model of a product about to be
manufactured, but that definition should be carried much further back in the process. It needs to include studies that may appear rough and simple and encompass more than just physical objects. Furthermore, it’s not necessary to be an industrial designer to adopt the habit of prototyping. Financial services executives, retail merchants, hospital administrators, city planners and transportation engineers can and should participate in this essential component of design thinking.

David Kelley, a Stanford professor and the founder of IDEO, calls prototyping “thinking with your hands,” and he contrasts it with specification-led, planning-driven abstract thinking. Both have value and each has its place, but one is much more effective at creating new ideas and driving them forward.

Quick and Dirty

Design thinkers, whether or not they happen to have been trained in any of the recognized disciplines, inhabit three “spaces of innovation.” Prototyping is one of the practices that enable design thinkers to occupy all three realms simultaneously.

Prototyping is always inspirational — not in the sense of a perfected artwork but just the opposite: because it inspires new ideas. Prototyping should start early in the life of a project, and we expect prototypes to be numerous, quickly executed and pretty ugly. Each one is intended to develop an idea “just enough” to allow the team to learn something and move on.

In the ideation space we build prototypes to develop our ideas to ensure that they incorporate the functional and emotional elements necessary to meet the demands of the market. As the project moves forward, the number of prototypes will go down while the resolution of each one goes up, but the purpose remains the same: to help refine an idea and improve it. If the precision required at this stage exceeds the capabilities of the team, it may be necessary to turn to outside experts — model makers, videographers, writers or actors, as the case may be — for help.

In the third space of innovation we are concerned with implementation: communicating an idea with sufficient clarity to gain acceptance across the organization, proving it and showing that it will work in its intended market. Here, too, the habit of prototyping plays an essential role. At different stages the prototype may serve to validate a subassembly of a subassembly: the graphics on a screen, the armrest of a chair, or a detail in the interaction between a blood donor and a Red Cross volunteer. As the project nears completion, prototypes will likely be more complete. They will probably be expensive and complex and may be indistinguishable from the real thing.

Returning to the Surface

There are three themes that make experiences meaningful and memorable: First, we now live in what Joseph Pine and James Gilmore christened an “experience economy” in which people shift from passive consumption to active participation. Second, the best experiences are not scripted at corporate headquarters but delivered on the spot by service providers. And third, implementation is everything. An experience must be as finely crafted and precision-engineered as any other product.

A Good Idea Is No Longer Enough

Innovation has been defined as “a good idea executed well.” This is a good start. Unfortunately, too much emphasis falls on the first half of that proposition. There are countless examples of good ideas that never gained traction for the simple reason of poor execution. Most of them never reach the market, and those that do end up littering the stockrooms of electronics stores and supermarkets.

Increasingly, ideas fail because people demand more of them than reliable performance in an acceptable package. The components of a product need to come together to create a great experience. This is a much more complicated proposition.

There have been many explanations for this new level of heightened expectation. In A Whole New Mind, author Daniel Pink argues that once our basic needs are met — as they already have been for most people in the affluent societies of the West — we tend to look for meaningful and emotionally satisfying experiences. We need only note the disproportionate growth of the service economies (entertainment, banking, health care) relative to manufacturing. Moreover, these services themselves have gone far beyond the support of basic needs: Hollywood movies, video games, gourmet restaurants, continuing education, ecotourism and destination shopping have grown dramatically in recent years. Their value lies in the emotional resonance they create.

The Experience Blueprint

Just as a product begins with an engineering blueprint, an experience blueprint provides the framework for working out the details of a human interaction. Unlike the plans for an office building, an experience blueprint also describes the emotive elements. It captures how people travel through an experience in time. Unlike a prepared
script or an operations manual, it connects the customer experience and the business opportunity.

From airlines and hospitals to supermarkets, banks and hotels, it’s clear that experiences are much more complex than inert objects. They vary from place to place, they change over time and they are hard to get right. Although the design of an experience may involve products, services, spaces and technology, an experience carries us beyond the comfortable world of measurable utility and into the hazy zone of emotional value.

The best and most successful experience brands have a number of things in common that may provide us with some secure guidelines. First, a successful experience requires active consumer participation. Second, a customer experience that feels authentic, genuine and compelling is likely to be delivered by employees operating within an experience culture themselves. Third, every touch point must be executed with thoughtfulness and precision — experiences should be designed and engineered with the same attention to detail as a German car or a Swiss watch.

**Spreading the Message**

Many notions have been proposed to explain what differentiates human beings from other species: bipedal locomotion, tool use, language, symbolic systems. Our ability to tell stories also sets us apart. In his provocative book *Nonzero*, the journalist Robert Wright makes the case that consciousness, language and society have developed an intimate relationship with technologies of storytelling throughout the 40,000-year history of human society. As we learned to spread our ideas, our social structures expanded from nomadic groups to tribes to settled villages and then to cities and states, followed by supranational organizations and movements. Before long the Japanese were cooling their buildings in the summer and heating them in the winter to make it bearable to go to work wearing Western-style clothes — and telling themselves stories about it.

Mostly we rely on stories to put our ideas into context and give them meaning. It should be no surprise, then, that the human capacity for storytelling plays an important role in the intrinsically human-centered approach to problem solving, *design thinking.*

**Designing in the Fourth Dimension**

We have already seen hints of storytelling at work: in ethnographic fieldwork; in the synthesis phase, in which we begin to make sense of large accumulations of data; and in the design of experiences. In each case, we are talking about adding not just a new widget but a whole new dimension to the designer’s toolkit: the “fourth dimension,” designing with time. When we create multiple touch points along a customer journey, we are structuring a sequence of events that build upon one another, in sequential order, across time. Storyboards, improvisation and scenarios are among the many narrative techniques that help us visualize an idea as it unfolds over time.

Designing with time is a little different from designing in space. The design thinker has to be comfortable moving along both of these axes.

An experience that unfolds over time, engages participants and allows them to tell their own stories will have resolved two of the biggest obstacles in the path of every new idea: gaining acceptance in one’s own organization and getting it out into the world. An idea may be a product, service or strategy.

**Where Do We Go From Here?**

Since the early 1990s, Nokia has been the most consistently successful cell phone manufacturer in the world. Nokia began as a paper mill in 1865 and through a sequence of investments moved from paper to rubber, cables, electronics and ultimately mobile phones. A combination of technological prowess, organizational innovation and top-notch industrial design kept Nokia ahead of the pack. In the last few years, however, the emergence of the mobile Internet has changed the rules of the game. In a growing number of markets it is no longer enough to have a snappy device with which to make a phone call or send a text. People want mobile information services, whether for searching maps or for networking with friends. It is no longer the hardware that matters but the services and applications it delivers.

Nokia saw this coming and in 2006 began to explore alternatives to its existing hardware-driven approach. Technologists, anthropologists and designers were sent out into the world to understand how consumers were communicating, sharing information and entertaining themselves and to look for what was missing. They found that people no longer simply wanted to make telephone calls. They wanted to express their creativity, to discover new things and to share what they found with others. They also found that people were often forced to cobble together a variety of devices to make this happen. Nokia had all the components, but they were not integrated with services that could connect people in richer, more powerful ways.

On the basis of these observations Nokia’s design
teams brainstormed, prototyped and explored a variety of new ideas that would enable the company to meet this need and seize this opportunity: mobile blogging, online gaming, photo sharing, location services and time management. The teams presented these concepts to management in the form of stories from the field and future-oriented scenarios intended to show how these new services might be pulled together into a seamless experience that involved not just the phone but the Web and desktop.

Under the new model, Nokia would continue to design and sell mobile handsets, but the design teams were proposing a radical new future in which hardware ceased to be the company’s offering and became the platform for a richly interactive, service-based business. Barely a year later, Nokia announced Ovi, a new service offering that could be accessed through any of its multimedia devices. Design thinking had enabled Nokia not only to explore new possibilities but also to convince itself that these possibilities were sufficiently compelling to move away from its strongly entrenched and previously successful approach. The timing was right. Today Ovi is one of the operating business divisions of the company, and Nokia — a technology leader — has reinvented itself as a service provider.

The New Social Contract

An organization that commits itself to the human-centered tenets of design thinking is practicing enlightened self-interest. If it does a better job of understanding its customers, it will do a better job of satisfying their needs. That is simply the most reliable source of long-term profitability and sustainable growth. In the world of business, every idea — however noble — must survive the test of the bottom line.

But this is not a one-sided proposition. Businesses are taking a more human-centered approach because people’s expectations are evolving. Whether we find ourselves in the role of customer or client, patient or passenger, we are no longer content to be passive consumers at the far end of the industrial economy.

As consumers we are making new and different sorts of demands; we relate differently to brands; we expect to participate in determining what will be offered to us; and we expect our relationship with manufacturers and sellers to continue beyond the point of purchase. To meet these heightened expectations, companies have to yield some of their sovereign authority over the market and enter into a two-way conversation with their customers. This shift is happening at three levels.

First, there is a seemingly inexorable blurring of the line between “products” and “services,” as consumers shift from the expectation of functional performance to a more broadly satisfying experience. Second, design thinking is being applied at new scales in the move from discrete products and services to complex systems. Third, there is a dawning recognition among manufacturers, consumers and everyone in between that we are entering an era of limits; the cycle of mass production and mindless consumption that defined the industrial age is no longer sustainable.

These trends converge around a single, inescapable point: Design thinking needs to be turned toward the formulation of a new participatory social contract. It is no longer possible to think in adversarial terms of a “buyer’s market” or a “seller’s market.” We’re all in this together.

As the circle of design thinkers grows, we will see solutions evolving that will improve the character of the products and services we buy. Even on a large scale and even at the level of the most challenging problems we face in our society today, design thinking can provide guidance.

Design Activism

The rise of design thinking corresponds to a culture change, and what excites the best thinkers today is the challenge of applying their skills to problems that matter. Improving the lives of people in extreme need is near the top of that list.

The greatest design thinkers have always been drawn to the greatest challenges, whether delivering fresh water to imperial Rome, vaulting the dome of the Florence Cathedral, running a rail line through the British Midlands or designing the first laptop computer. They have searched out the problems that allowed them to work at the edge because this was where they were most likely to achieve something that has not been done before. For the last generation of designers, those problems were driven by new technologies. For the next generation, the most pressing — and the most exciting — challenges may lie in the highlands of southeast Asia, the malarial wetlands of East Africa, the rain forests of Brazil and the melting glaciers of Greenland.

Martin Fisher, a Stanford Ph.D., reluctantly agreed to a 10-month assignment in Kenya, where he ended up staying for 17 years. In Nairobi he observed that people in poor countries who have been thrust into the global economy do not need money so much as the means to earn money. Together with his development partner
Nick Moon, Fisher founded KickStart, a provider of low-cost “microtechnologies” including a treadle-operated deepwater pump — significantly called the “Super MoneyMaker” — that have helped more than 80,000 local farmers launch small businesses in East Africa. Fisher understood that the ingenious pumps, brick presses and palm-oil extractors were not enough. His customers needed a local infrastructure including marketing, distribution and maintenance. Educated in the high-technology world of Silicon Valley and schooled in the slums of Nairobi, Fisher shows how design thinking extends the perimeter around a problem.

Finding ways to apply the principles of design thinking to the problems of society — on the outskirts of Kampala, in the offices of a social venture fund in New York or in the classrooms of an elementary school in California — is the sort of problem that is attracting the most ambitious designers, entrepreneurs and students today. They are motivated not by an altruistic desire to “give something back” for a few months after graduation or upon retirement but by the fact that the greatest challenges are always the source of the greatest opportunities.

**Designing Tomorrow — Today**

One of the most satisfying things about thinking like a designer is that the results are tangible. Something new exists at the end of a project that didn’t exist before. Remember to document the process as it unfolds (we don’t wait for our kids to become finished adults before taking their pictures!). Shoot videos, preserve drawings and sketches, hold on to presentation documents and find somewhere to store physical prototypes. Assembled as a portfolio, this material will document a process of growth and record the impact of many minds. It is hard not to feel proud of your contribution when you have a record of it.

**Design a Life**

Design thinking has its origins in the training and professional practice of designers, but these are principles that can be practiced by everyone and extended to every field of activity. There is a big difference, though, between planning a life, drifting through life and designing a life.

We all know of people who go through life with every step preplanned. They knew which university they would attend, which internship would lead to a successful career and at what age they will retire. If they falter, they have parents, agents and life coaches to take up the slack. Unfortunately, this never works. And any-way, if you know the winner before the start, there’s not much point in playing the game.

Like any good design team, we can have a sense of purpose without deluding ourselves that we can predict every outcome in advance, for this is the space of creativity. We can blur the distinction between the final product and the creative process that got us there. Designers work within the constraints of nature and are learning to mimic its elegance, economy and efficiency, and as citizens and consumers we, too, can learn to respect the fragile environment that surrounds and sustains us.

Above all, think of life as a prototype. We can conduct experiments, make discoveries and change our perspectives. We can look for opportunities to turn processes into projects that have tangible outcomes. We can learn how to take joy in the things we create whether they take the form of a fleeting experience or an heirloom that will last for generations. We can learn that reward comes in creation and re-creation, not just in the consumption of the world around us. Active participation in the process of creation is our right and our privilege. We can learn to measure the success of our ideas not by our bank accounts but by their impact on the world.

**A Good Story**

At the heart of any good story is a central narrative about the way an idea satisfies a need in some powerful way. As it unfolds, the story will give every character represented in it a sense of purpose and will unfold in a way that involves every participant in the action. It will be convincing but will not overwhelm us with unnecessary detail. It will include plenty of detail to ground it in some plausible reality. It will leave the audience with no doubt that the organization “narrating” it has what it takes to make it real. All this takes skill and imagination.

**Recommended Reading List**

If you liked *Change by Design*, you’ll also like:

1. *Buyology* by Martin Lindstrom. What truly influences our decisions to buy in today’s message-cluttered world? Martin Lindstrom presents astonishing findings from his groundbreaking neuromarketing study.

2. *From Concept to Consumer* by Phil Baker. Renowned product developer Phil Baker explains how a great idea accounts for only 5 percent of all the factors of success. He shows how to take an idea and turn it into a successful product.

3. *The Shift* by Scott M. Davis. *The Shift* shows how a new breed of Visionary Marketers has become a successful catalyst for growth and transformation within an organization.