

C H A P T E R

1

OUR MODELS DEFINE OUR WORLD

In the old world, managers make products. In the new world, managers make sense of things.

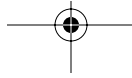
—John Seely Brown¹

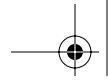
It's midnight, and you hear a loud radio in the apartment downstairs.

Last week the quiet old man who lived there passed away, and you've been concerned about the arrival of the next tenant. You never know who might move in, and you've heard some real horror stories from your college friends. In an apartment house, the wrong neighbors can make your life miserable.

Now your worst fears have come true. The rock music plays on and on. You toss and turn, looking at the clock. At 12:30 a.m., you decide to wait just a little longer. Even if your new neighbor is a jerk, you are reluctant to turn your first meeting into a fight. At 1:00 a.m., the radio is blaring just as loud. What kind of party are they throwing down there? You've got to get up for work tomorrow. How can a person be so ignorant? So you walk down to lecture this idiot on common courtesy. You knock heavily on the door, and it swings open. You are surprised to find the apartment completely bare. There is no sign of your new neighbor. There isn't even a sign of furniture. So you walk in. In the back room you find some drop cloths and paint cans. Plugged into one wall, you see a boom box cranked up full.

There is no neighbor, just a careless painter who left the radio on when he left for the day. The new tenant hasn't even arrived yet. The ignorant neighbor that you invented based on the noise vanishes into air, but the anger and other emotions you felt are still very real. You have trouble settling





down and going back to sleep because you are still angry at this neighbor, a neighbor who exists only in your mind. You created this evil figure to explain the loud music, and he took on a life of his own. If you hadn't gone down and knocked on the door, you might have lived with this illusion for days.

Your mental models shape the way you see the world. They help you to quickly make sense of the noises that filter in from outside, but they can also limit your ability to see the true picture. They are with you always and, like your neighbors, can be a great help or can keep you up at night without reason.

What are mental models, and how do they shape your understanding and define the world you live in?

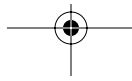


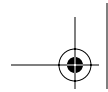
Can the wrong mental model kill you? Over the past quarter century, more than 150 children have died in the United States after their parents chose not to provide medical treatment because of their religious beliefs.² The parents belonged to one of some 20 religious groups whose teachings deny the use of traditional medical care, relying instead on faith healing. The results are often tragic.



In April 1986, two-year-old Robyn Twitchell died of a bowel obstruction in Boston, Massachusetts. His parents, Christian Scientists, took the boy to a church practitioner who prescribed only prayer. The child's condition worsened. He had difficulty eating and sleeping. He was shaking and vomiting. Five days after the onset of the illness, he became unresponsive. The parents and the practitioner continued to trust in prayer up to the time of his death. The parents were convicted in July 1990 of manslaughter.

Experts testified that the condition could have been treated with a simple operation to remove the twisting of the bowel, an operation that would have very likely saved the child's life. This procedure, based on a surgical model of treating disease, was not considered by the boy's parents because of the mental model they held about the causes and treatment of disease. In a certain sense, the boy's death was due to the way they made sense of the world.





This story is not presented to pass judgment on the parents for their tragic decision or criticize their religious beliefs. It does offer an example of a single decision that is viewed through divergent models—the parents’ beliefs and the medical perspective that the courts used in ruling on the case. In the court’s opinion, the outcome of following the parents’ model was very likely much worse than the outcome that could have been achieved from following a medical model.

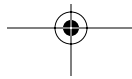
While their impact is rarely so sharply defined as in this case, our mental models can affect our lives, careers and relationships; the prosperity of our businesses; and the quality of life in our societies. Almost every aspect of our lives is shaped in some way by how we make sense of the world. Our thinking and our actions are affected by the mental models we hold. These models define our limits or open our opportunities. Despite their power and pervasiveness, these models are usually virtually invisible to us. We don’t realize they are there at all.

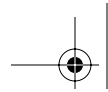
We believe that what we see is reality rather than something we create inside our heads. The parents of Robyn Twitchell believed that prayer alone was going to cure him. For them, this was reality. The surgeons who could have treated the child saw the case through a completely different set of eyes, as did the criminal justice system. We might think of mental models as something abstract or academic—to be studied and explained like optical illusions—but in this case and many others these models clearly are anything but academic. They not only shape what we see and how we understand the world but also how we act in it. In a real sense, what we think is what we see, and what we see is what we think.

How do the models you use to understand your life keep you locked in certain patterns of thought or prevent you from seeing solutions that are right in front of you? What are the potentially negative effects of your current models? How could you change your models to improve the quality of your life?

Rethinking IBM’s Research Model

Models also limit or open new opportunities in business. In the early 1990s, the head of research at IBM, Jim McGroddy, came to





visit one of the authors (Colin Crook), who was then chief technology officer at Citicorp. McGroddy faced a serious challenge. IBM was losing billions of dollars every year. How could the research program help turn this situation around?

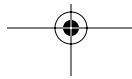
Crook discussed the information-technology value chain that was guiding IT development at Citibank. This value chain had three basic levels: at the bottom were atoms and basic math; in the middle was technology, such as storage, displays and chips; and at the top were customer solutions. What was really important, he said, was the work on these customer solutions, and that was where Citicorp was differentiating itself from rivals.

McGroddy realized that this focus on customer solutions had been largely ignored by IBM Research. Most of the company's attention was on basic research at the bottom level or on technology in the middle. The company had become insular and product-focused, losing touch with its customers. This realization led to a reorganization of IBM Research and the creation of a new strategic area focusing on services, applications and solutions. IBM's successful turnaround was driven by research in that category, which increased from nearly zero in 1990 to more than 25 percent in 2001. This dovetailed nicely with the launch of new chairman Lou Gerstner's global services initiative, which became the fastest growing area for IBM.³

IBM may not have recognized it, but its research had been driven by a technocentric mental model. When this model was recognized and challenged, new opportunities could be seen, the organization could be redesigned and the business could be transformed (a transformation that was, of course, much broader than R&D). What looked like an R&D problem could be rethought from the perspective of the market. What looked like a difficult technological problem could be reconsidered as a challenge of business design.

Compartmentalization of Business and Personal Life

We recently spoke with a successful manager who remarked that when she needs to hire a new employee, she inevitably turns to a





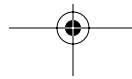
headhunter. But in her personal life, she trusts to chance to find a life partner. It is a similar challenge of finding the right person with the right characteristics and chemistry, but she applies a completely different approach because she has a different mental model for her personal and business life. She would never think about going into a single's bar and hoping to stumble across the perfect vice president of marketing, but she will in her personal life. Because of this artificial wall, she was much less creative in thinking about her personal life (and less successful in filling the position for a life partner) than in her business life where she routinely found great people to fill key positions.

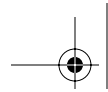
One of the limiting frames we have is the separation of business and personal life, even as these two worlds are merging together. Look at how many TV entertainment programs have a work setting for portraying stories of personal lives. As the lines between business and personal lives blur, there are opportunities for shifting our thinking within business and personal life and across the two. We can borrow mental models from one area and apply them to the other to change the way we see both aspects of our lives.

Domestic Emerging Markets

To take another example, consider how most companies view inner-city markets. These markets tend to be areas with low incomes, high crime rates and other risks or costs—in short, they are seen as a marketer's nightmare. Even as major companies are waking up to the potential of emerging markets around the world, inner-city markets are still largely neglected. Yet, as Michael Porter has pointed out, these markets have distinctive advantages and hidden opportunities if we look more closely.⁴ While income may be lower, population density is much higher so “spending power per acre” is comparable to more affluent parts of the city. These markets are in strategic locations and often present demographics segments that are crucial to future market growth.

If we were to reframe the inner city as “domestic emerging markets,” what new possibilities would this open? What strategies that are being used to address emerging markets in China and





India might be applied in the cities of the United States and other developed nations with good effect? This simple shift in the way we view these markets could open new possibilities for strategies and new potential for growth.

How do your models for your industry and business prevent you from recognizing opportunities and realizing the full value of your organization?

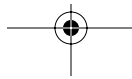
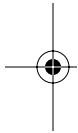
THE PARALLEL UNIVERSES IN OUR MINDS

The brain, weighing on average just around three pounds, has a complexity of structure and function that we are only just beginning to understand. Estimates vary, but we have around 100 billion neurons, which communicate via perhaps several hundred trillion synapses. The whole brain is awash in a swirl of neurochemicals, and lightning storms of electrical activity flicker across it, as millions of sensory signals from the eyes, ears, nose, mouth and skin are thrown into the mix.

It is a wonder we can even think. And yet we do. A linear processing machine bombarded with this flood of stimulation would probably shut right down. The brain is quite different. It somehow makes sense out of the welter of flashing signals. The human mind engages in daily magic tricks that make David Copperfield look like a parlor act. Studies in neuroscience indicate that the sense we make of external things is based in small part on what we see outside and in large part on the patterns located in our minds.

MKANIG SNESE FROM NSOSNESE

As Lewis Carroll demonstrated in the “brillig” and “slithy toves” of his poem *Jabberwocky*, it takes only a little bit of context for our marvelous sense-making abilities to draw meaning from absolute gibberish. With a little effort, the following statement, circulating online, should





make this point clear. While neither the study nor the university are formally identified, the words, however garbled, speak for themselves:

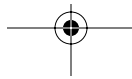
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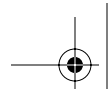
Ask yourself: Does the rest of your life have this many holes that you are not seeing?

The mind appears to do this, in part, *by choosing to ignore some of the external world*. American neurophysiologist Walter Freeman discovered that the neural activity due to sensory stimuli disappears in the cortex. Our eyes and ears are constantly gathering information, but our mind is not really processing all of it (see sidebar, “Mkanig Snese from Nsosnese”). This stimulation flows into the brain, where what seems to be an internally related pattern appears, which the brain uses to represent the external situation.

The brain takes in the information about the world through the senses and then discards most of it, using it principally to evoke a parallel world of its own. Each brain creates its own world, which is internally consistent and complete. Perception is not a linear process of information reception, processing, storage and recall. Instead it is a very complex, interactive, subjective and evocative process.

It is as if a visitor came to the front door and rang the bell, and the person inside, by a quick glance through the fisheye peephole, formed a complete profile of the person outside, without opening the door. We know from experience that we have the ability to form snap judgments about people immediately—and that these judgments are sometimes wrong. Yet this process is extraordinarily efficient and effective, which is why there are peepholes in doors in the first place. Unlike a baby first learning about the world, we don't have to try to make sense of every new





piece of information. Given a few lines, we can fill in the entire image. This ability to respond intuitively to what we see is crucial to quick thinking and action. (In Chapter 10 we discuss the power and limitations of intuition.)

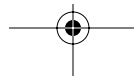
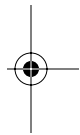
Building Our Brains

The brain has developed and changed throughout human evolution, and its layered structure clearly shows this, starting deep within with the oldest “reptilian” part and moving out through the “limbic” system to the “neocortex,” the seat of rational behavior.

Our own brains change and evolve over time, with neurons constantly dying and being recreated, synapses being destroyed and created anew. The brain selects and reinforces or weakens certain synapses to forge the complex neural structures that determine our thinking. Then we reshape these neural “models” through experience, education and training.

The newborn child has a fundamental but only rudimentary capacity to make sense of the signals, probably derived from genetic instructions. Subsequent experience works upon this genetic foundation. The child’s first, urgent task is to quickly develop the capacity to make sense of all these confusing signals. Within the first two years, most children appear to develop this capability. The process involved is to understand where the stimulus comes from and then categorize the signal as some specific case of a more general pattern. A mix of shadows and colors is recognized as a ball. The face hovering above the baby is recognized as the mother—but then all similar faces are also seen as mother until the model is refined. The child is able to form a holistic sense without getting bogged down in the details. This categorization is key. These experiences are also retained in the form of memory—complex patterns spread across the brain that are not representational but are evoked by other patterns and external stimuli.

As the internal worlds in the child’s mind become richer, the external world recedes. Freeman’s experiments show that the balance tips from the outside to the inside. The brain’s own models replace the input signals from external sources. When the brain





confronts a new experience, it calls up a complex neural activity or “mental model” that seems to be its nearest equivalent. We see the absence of these models in the child’s wonder at the simplest of experiences. We feel their presence when we express regret about the familiar routines and ruts that sometimes determine our lives in adulthood. The development of mental models is, in a certain sense, a demarcation line between childhood and maturity. We increasingly live in a familiar world that can be considered as a benign illusion—benign, because it helps us move through the world efficiently, but an illusion nonetheless.

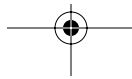
We eventually lose all awareness that these “models” are in fact internal illusions. We accept them as external reality and act on them as if they were. If they are good models, in most circumstances they more than adequately permit the mind to handle external reality. But here a danger creeps in. When the world changes in important ways, we can find ourselves with a model that is completely irrelevant to the current situation. We find ourselves wearing our street clothes when we are thrown off the deck of a ship. What we need at that point is a wet suit and lifejacket.

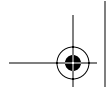


WHERE “MODELS” COME FROM

Constant training shapes and refines our “models.” A jazz musician or modern artist probably has a very different view of many aspects of the world than, say, a scientist or engineer. Even training doesn’t fully explain our models. Not every musician or engineer will look at the world in the same way. A breakthrough thinker like Albert Einstein might have much more in common with a modern artist than with some of his colleagues in science. Some individual scientists may creatively push the limits; others may work in a well-defined area of study. Some CFOs may be risk averse while others are daring to the point of danger. Their approaches are shaped by their personality (genetics), education, training, influence of others and other experiences.

We can gain insights into our “mental models” by looking at where they came from. There has been a long debate about the



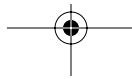
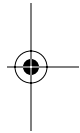


influence of nature versus nurture in shaping our thinking. At the moment, it appears increasingly likely that nature, in the form of genetics, plays a significant role in determining who we are. Many of the basic capabilities of the brain, such as language, appear to be predetermined at birth by virtue of the genetics we inherit.

Clearly we are born with some hardware and hard wiring that influences the way we see the world. Mood disorders offer an extreme example of how these chemical and genetic differences can color the way we see the world. While genetic research and pharmaceutical interventions are offering new ways to change the structure and chemicals of our thinking, their exact impact on mental models is unclear. As much as we might like to find one, there is no pill or genetic therapy for changing our mental models, although at some point in the future development of science it may fall within the realm of possibility. There also seems to be considerable flexibility in the human mind in overcoming the limitations of nature.

Genetics appear to provide the fundamental basis of who we are and what we can do, and then experience plays a major role in shaping these capabilities, strengthening some and weakening others. Thus a number of forces of “nurture” shape and reshape our “mental models,” including:

- **Education.** Our education shapes our mental models very broadly and forms a foundation that molds our world view. A scientist learns to approach the world in a different way than a jazz musician. This broad education is often the least visible force shaping our mindset. We surround ourselves with people of similar background. A liberal arts education aims in many ways to give people a common language and world view from which to operate, so it is very easy for this educational foundation to blend into the environment like a chameleon on a rock. While deepening knowledge in a subject area is one kind of learning, learning about mental models represents a second kind of learning (see sidebar, “A Second Kind of Learning”).
- **Training.** Related to education is the specific training we receive to deal with transitions or handle new tasks. A com-

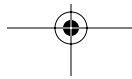
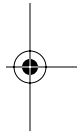


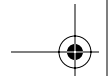


puter programmer might learn a programming language, or an artist might learn to work in metal sculpture. This training is more specific and more visible than education, and more easily changed. Still, we often get into a rut in our training that is very difficult to break out of, even when the world around us has changed significantly.

- ***Influence of others.*** We are all influenced by mentors, experts, family and friends. These individuals, their philosophy of life and approach to problems affect us deeply in how we approach our own challenges. We are also influenced by the books we've read. For example, a child who grows up reading all of H. G. Wells' novels might be influenced by this experience to become a scientist. We are influenced by people in our immediate environment—first by parents, friends and teachers and later by supervisors and coworkers—who push us in new directions or encourage us to achieve more, challenging our own views of ourselves. We also are influenced by broader trends in society, as were many people who grew up in the 1960s. Finally, we are influenced by mass culture in a world in which MTV can transfer fashion trends around the globe in a matter of hours.
- ***Rewards and incentives.*** Our mental models and actions are shaped by the rewards we receive for holding them. These rewards can be tangible, such as direct financial gain, or less tangible ones, such as social approval.
- ***Personal experience.*** Some artists and scientists are self-taught. They create their own style through personal experience, which makes it easier to think outside the mainstream. The tradition of apprenticeship is also based on a process of combining learning from both experience and a mentor or expert craftsman.

In addition to the specifics of what we learn in our education, we also develop capabilities for *learning how to learn* that help us to make sense of our experiences. Our own successes and failures can dramatically shape our view of the world. Personal encounters can have a major impact on how we view life overall or in specific areas. How we cope with mistakes and learn from our successes affects how we approach every new challenge. Severe





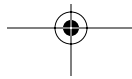
ordeals, such as imprisonment in a concentration camp or traumatic childhood abuse, may affect our world view throughout our lives. Some people find their worlds crushed and limited by these misfortunes. Others respond by developing a determination and drive that carries them not only across their present hurdles but also to new levels of success.

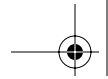
Today's experience quickly becomes tomorrow's theology. This is why generals are often fighting the last war. They have shaped their policies based on their past equipment and military strategy, carefully learning lessons from debriefings on the last battlefield that may no longer be relevant on the current one (although post-mortems can be a valuable source of insights as long as we recognize that the world may change). Experience can be a double-edged sword.

Models for the Moment

Some of our models are very broad, held by members of an entire nation, political party or religious group, while others are very localized and specific. A broader model such as a belief in democracy or communism affects the mental models of followers, influencing their beliefs and behavior as well as the entire structure of society and economic life. Not all our models are on such a grand scale. Our background and philosophical beliefs often affect how we see the world, but we also apply situation-specific models. A fire drill or airplane evacuation routine is an example of a situation-specific model. Whatever our backgrounds, training and experience, we all look for the nearest exit, put on our oxygen mask if it is deployed from the ceiling or inflate our life vests.

In this case, the goal is to give everyone a common model that seems to be best practice in responding to a particular emergency. But when passengers on the flights of 9/11 were faced with a situation that was not on the cards in the seatbacks, they needed to improvise and create a model based on their experience, drawing upon past experiences such as sports, military training, stories or movies.





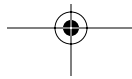
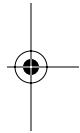
In many cases, our background and experience determine how we will respond in a particular situation. When Johnson & Johnson made its famous decision to pull its product off the shelves in response to the Tylenol scare in 1982 (when an unknown tamperer laced the capsules with cyanide, killing seven people in Chicago), the company's actions were based on a firmly embedded set of values embodied in the corporate "credo." It set a course of action that was consistent with its core mental model—that if it put its customers and other stakeholders first, returns to shareholders would naturally follow.

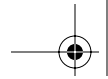
Sometimes our responses to specific challenges ultimately transform our broader models. Consider the long-held opposition to big government by the U.S. Republican party. In the face of terrorist attacks and scandals on Wall Street early in the new millennium, the Republican administration expanded government staffing, budgets and powers to meet these new threats to national economic stability. The proponents of reducing government had actually expanded it. The specific actions, designed to meet the challenges of the moment, ultimately undermined the broader model.

This view of the application of models for the moment is in contrast to approaches such as Meyers-Briggs, which attempts to define a specific individual style of approaching decisions. While the recognition of the different cognitive styles (such as perceptive/receptive, or systematic/intuitive) is an important one, we are not necessarily static in how we apply these approaches. An individual may work through a variety of styles in addressing specific challenges or responding to specific situations.

A SECOND KIND OF LEARNING

There is a lot of discussion about the importance of creating what Peter Senge and others have called a "learning organization." We recognize the importance in personal development of continuing to engage in what Stephen Covey refers to as "sharpening the saw."





But in the application of these ideas to our business and personal lives, we often fail to make a distinction about two kinds of learning.

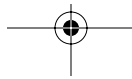
The first kind of learning, which is far more common and more easily achieved, is to deepen our knowledge within an existing mental model or discipline.

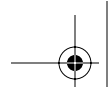
The second kind of learning is focused on new mental models and on shifting from one to another. It does not deepen knowledge in a specific model but rather looks at the world outside the model and adopts or develops new models to make sense of this broader world. Sometimes we don't need to merely "sharpen" the saw; we need to throw it out to pick up a power tool. If we are focused only on sharpening, then we might not see the opportunity to apply new technology that can radically change the way we approach the task. The sharpest saw in the tool box may be no match for a powerful new approach based on a new way of looking at the world.

This book focuses primarily on this second kind of learning. It is not just doing a better job at the current task but asking whether it is the right approach and how we might be able to change it. It is not the kind of learning that results from an engineer's taking the 100th course in engineering, but rather the kind that comes from her taking a first course in jazz, which allows her to look at engineering problems from a completely new perspective. Learning about new mental models is much more challenging and complex, but crucial in an environment of rapid change and uncertainty.

AVOIDING OBSOLESCENCE

During the painful layoffs and restructuring at Citicorp in the early 1990s, we witnessed the following uncomfortable scene: A talented computer programmer in his forties, facing the loss of his position, was shocked to find that he was no longer needed





because his skills in COBOL programming were obsolete. This bolt came totally out of the blue, because he was a good programmer. He just hadn't kept up. Not only this, but as he worked through outplacement, he discovered to his horror that his skills were no longer valuable to *anyone*. He had been cruising along in his career, unaware of the changes around him, and now he found that the road he was traveling led right off a cliff.

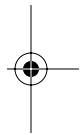
Could this programmer have been better prepared if he hadn't been locked in an outdated mindset? Even if he couldn't have prevented his dismissal, could he at least have been better able to move forward afterward?

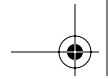
If the world remained static, we might be able to remain blissfully unaware of our models. Like our primitive hunter-gatherer ancestors, our basic instinct and experience would serve us well from childhood throughout our relatively short lives. But today the world changes ever more rapidly, and we need to be able to recognize our own models, to know whether and how to change them, to act quickly, and to influence the models of others.

Like the programmer in the example above, we often don't see the need to change until we experience the pink slip, the divorce, the lawsuit or the heart attack. Then, if it is not too late, we wake up to see that our old mental models no longer work. (Surprisingly, even these shocks sometimes are not enough.)

It doesn't have to be this way. You can consciously change your mental models before the world forces you to do so. Some of the people at Citicorp, including many who ultimately survived the job cuts, made a conscious effort to immerse themselves in the outside world. They explored different aspects of technology, such as new programming languages and techniques, and brought these new perspectives to their work. They actively challenged their own mental models and those around them. They continued to develop new and useful mindsets that were valuable to the organization. They became leaders of the transformations that were needed to turn the company around.

At any given point, we have a choice in how we view the world. But we are not always aware of these choices. The models we





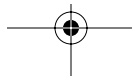
have developed through our education and experience are often invisible to us until it is too late.

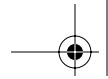
In a changing environment, we can either transform ourselves or be transformed. Every day individuals in their work and personal lives prove that it is possible to change before life itself gives them a painful wakeup call. But to transform our lives, we have to first transform our minds. Our mental models determine what we are able to see and do.

THE CONSEQUENCES OF MODELS

We live in a world of great risk and great possibilities. We have unprecedented opportunities to blend the best of the old and new, to open up new perspectives and connect to different fields of knowledge, like sampling from a buffet. Yet it is a risky business to abandon our old views of the world. We have seen the traditional views of religion, family, institutions and belief in capitalism eroded in recent years, with some positive consequences but also some degree of chaos rushing into the vacuum. When we depart from the dry land in business or personal life, we are subject to the crosswinds and crosscurrents of whatever crackpot ideas and fads come toward us. If we can navigate this passage to new mindsets, we will have opportunities to discover new worlds with rich potential.

Our true work, as John Seely Brown points out in the quote that opens this chapter, is making sense. It is not just for managers in business but for everyone in business, politics and personal life. As in a detective story, we are in a race against time, against clever rivals who deliberately or inadvertently create decoy trails to throw us off the scent. In a world of deep complexity and extensive information, this work of making sense has never been harder—or more important. Unlike most detective stories, this one does not have a simple (The butler did it!) answer at the end, unless we discover it or create it. It does not even have an ending.

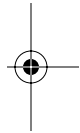




The world we see today could undergo a gestalt flip tomorrow. We can get better at this process of making sense—and the first step is recognizing that there is a process at all.

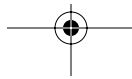
Some will argue that the world is already far too complicated for us to make sense of it. They act as if we need to just keep our heads down, focus on the track in front of our feet and keep moving. That may work for a limited time (until some freight train comes barreling down the track we're walking on). But our strength as human beings is our power to make sense, adapt to a fabulously complex world and quickly decide on a practical course of action. This is how we have survived and progressed since the age of the sabertooth tiger. It is how we can succeed in today's complex world.

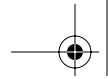
In today's complicated and uncertain environment, the greatest dangers are not from beasts prowling around outside. More often than not they are in our own minds, our inability to see our own limits and to see things differently. It is these internal beasts that we seek to better understand—and learn to live with, if not to tame—in the pages of this book.



IMPOSSIBLE THINKING

- What are your mental models that shape your thinking? How are your models different from those of others?
- What are a few recent decisions, personal or professional, in which you can identify the role of mental models in how you framed the problem or developed your solution?
- How has your own education and experience affected your mental models?
- What are the potential blindspots of your models and experience?
- How can you seek out new perspectives and experience to help challenge or change your current models?





ENDNOTES

1. Address to Complexity Conference in Phoenix, Arizona, February 1997.
2. "Death by Religious Exemption." *Massachusetts Citizens for Children*. January 1992. <http://www.masskids.org/pcama/religion_1cases.html>.
3. Thanks to Robert Buderer for reviving this example in "The Once and Future Industrial Research." *26th Annual Colloquium on Science and Technology Policy*. Washington, DC. 3–4 May 2001.
4. Porter, Michael E. "The Competitive Advantage of the Inner City," *Harvard Business Review* (May–June 1995), pp. 55–71.

