CHAPTER ONE

JUGAAD
A Breakthrough Growth Strategy

We reached Ramakrishna Nagar, a village in the desert of Gujarat, a state in Western India, after travelling 250 miles from Ahmedabad, the state's capital. Our team—a Silicon Valley management consultant, a business school professor from the University of Cambridge, and the founder of a Minneapolis advisory boutique and media firm—had set out a few months earlier on an extensive research and travel project. Our mission: to discover new approaches to innovation in emerging markets such as India that could help Western firms take on the complexity of our tough and turbulent times.

We came to Gujarat to meet with Professor Anil Gupta at the Indian Institute of Management (IIM) in Ahmedabad.[1] Professor Gupta runs Honeybee Network, a non-profit organization that identifies and cross-pollinates grassroots innovation all across India. Over more than two decades, Honeybee had populated a database with over ten thousand inventions of grassroots entrepreneurs who have created ingenious solutions for pressing socioeconomic problems in their local communities. Professor Gupta suggested we meet with one of these rural entrepreneurs.

As we left an arrow-straight concrete highway to follow narrower and increasingly cratered gravel roads, the temperature rose to a debilitating 120 degrees. Stepping out of our air-conditioned jeep, we could feel the weight of the desert's oppressive heat.

Mansukh Prajapati greeted us warmly outside his workshop.[2] A potter by trade, Prajapati had for years been experimenting with clay to produce a variety of durable goods, many of which were on display in the office outside his "lab." We were parched—and grateful when he asked

us if we wanted water. We had run out, and there wasn't any sign of a store or kiosk nearby to restock. He reached around to a faucet, handed us cups, and, beaming with pride, said, "Please, have this cold water—from my fridge."

Baffled, we looked more closely at the terra-cotta box in front of us. It was made entirely of clay, except for a glass door and a plastic faucet at the bottom. While sipping the refreshingly cool water, we looked around and found no electrical cord, no battery—just clay. Amused by our expressions, Prajapati explained how this clay fridge—the Mitticool (*mitti* means "earth" in Hindi)—works: water from an upper chamber seeps through the side walls, cooling the lower food chamber through evaporation. The fridge consumes no electricity, is 100-percent biodegradable, and produces zero waste during its lifetime. An ingenious invention!

But this inventor and his personal story are even more impressive. Prajapati doesn't work for NASA or Whirlpool, and he doesn't have a Ph.D. in quantum physics or an MBA from Stanford. In fact, he didn't even finish high school. His R&D lab—a simple open-air room with clay in various shapes and forms arrayed on the floor and an oven tucked away in the corner—is a far cry from the sprawling campuses of GE and Whirlpool, which swarm with hundreds of engineers and scientists.

In 2001, an earthquake had devastated Prajapati's village and the surrounding area. Reading a report of the devastation in the local newspaper, he noticed a photo caption: "Poor man's fridge broken!" The photo featured a smashed earthen pot commonly used by villagers to fetch water and keep it cool. And though the newspaper had called it a fridge in jest, it triggered Prajapati's first eureka moment. *Why not use clay*, he thought, *to make a real fridge for villagers—one that looks like a typical fridge, but is more affordable and doesn't need electricity?* Over five hundred million Indians live without reliable electricity, including most of the people in Prajapati's village.[3] The positive health and lifestyle benefits of owning a fridge in a desert village where fruit, vegetables, and dairy are available only intermittently would be tremendous.

Prajapati's training as a potter, coupled with his intuition, told him that he was on to something. He experimented for several months and

eventually had a viable version of the Mitticool that he began selling to people in his own village. The fridge—which costs around US$50—was a hit. Prajapati worked tirelessly on design improvements, and began selling Mitticools across India, and then internationally. He couldn't keep up with the rising demand and had to find ways to scale up—fast.

Then he had a second eureka moment. Why not transform pottery from an artisanal craft into an industrial process? He could leverage his traditional knowledge of pottery to mass-produce goods that met modern consumer needs. So Prajapati first developed an entirely new and more efficient method of working with clay. Then he began training women in his village in these industrial pottery techniques and finally hired them to work in his new factory. Soon a "mini" Industrial Revolution in pottery was launched in this remote Indian village.

Mitticool was the first product that Prajapati mass-produced in his factory. He soon built other products from clay, such as a nonstick frying pan that retains heat longer than other frying pans and costs a mere US$2. From one man and one idea has grown a frugal yet fruitful industry, one that employs large numbers of people in his own community and serves consumers in India and abroad. Prajapati's groundbreaking inventions, which deliver more value at less cost, have earned him accolades from all over the world—including from the president of India. And *Forbes* magazine recently named him among the most influential rural Indian entrepreneurs, one of few to have made an impact on the lives of so many.[4]

JUGAAD: THE GUTSY ART OF IMPROVISING AN INGENIOUS SOLUTION

The Mitticool, an idea born out of adverse circumstances, shows how a resilient mindset can transform scarcity into opportunity. Combining limited resources and a never-say-die attitude, Prajapati tapped into his empathy and passion for his fellow community members to conjure up an ingenious solution that improved lives in Gujarat and beyond. Not only did he produce a cheap and effective cooling device, but he also created jobs for dozens of undereducated women. In doing so, Prajapati

is both driving environmental and socioeconomic sustainability in his community and ensuring the financial sustainability of his own business. Prajapati embodies the true spirit of *jugaad*.

Jugaad is a colloquial Hindi word that roughly translates as "an innovative fix; an improvised solution born from ingenuity and cleverness." Jugaad is, quite simply, a unique way of thinking and acting in response to challenges; it is the gutsy art of spotting opportunities in the most adverse circumstances and resourcefully improvising solutions using simple means. Jugaad is about *doing more with less*. (We feature articles and videos on jugaad on our companion website, JugaadInnovation.com.)

Jugaad is practiced by almost all Indians in their daily lives to make the most of what they have. Jugaad applications include finding new uses for everyday objects—Indian kitchens are replete with empty Coke or Pepsi bottles reused as ad-hoc containers for dried legumes or condiments—or inventing new utilitarian tools using everyday objects, like a makeshift truck cobbled together with a diesel engine slapped onto a cart (interestingly, the origin of the word jugaad, in Punjabi, literally describes such makeshift vehicles).

The word jugaad is also applied to any use of an ingenious way to "game the system." For instance, millions of cellphone users in India rely on "missed calls" to communicate messages to each other using a prearranged protocol between the caller and receiver: think of this as *free textless* text messaging. For example, your carpooling partner may give you a "missed call" in the morning indicating he has just left his house and is on his way to pick you up.[5] Hence, the word jugaad carries a slightly negative connotation for some. But by and large, the entrepreneurial spirit of jugaad is practiced by millions in India simply to improvise clever—and completely legitimate—solutions to everyday problems.

In this book, we delve into the frugal and flexible mindset of thousands of ingenious entrepreneurs and enterprises practicing jugaad to creatively address critical socioeconomic issues in their communities. Jugaad innovators like Mansukh Prajapati view severe constraints, such as a lack of electricity, not as a debilitating challenge but as an opportunity to innovate and overcome these very constraints.

The entrepreneurial spirit of jugaad is not limited to India. It is widely practiced in other emerging economies such as China and Brazil, where entrepreneurs are also pursuing growth in difficult circumstances. Brazilians have their own word for this approach: *gambiarra*.[6] The Chinese call it *zizhu chuangxin*.[7] The Kenyans refer to it as *jua kali*.[8] The French have a term too—Système D.[9] Throughout this book we profile jugaad entrepreneurs from Argentina, Brazil, China, Costa Rica, India, Kenya, Mexico, the Philippines, and elsewhere who have created simple yet effective solutions to address vexing problems that their fellow citizens face. We hope to shed light on how these jugaad innovators think and act—and identify the valuable lessons we in the West can learn from them.

JUGAAD IN THE WEST

While jugaad is currently the dominant form of innovation in emerging markets, in the West it is practiced only in isolated instances. And although the 1980s TV series *MacGyver* popularized the American jugaad spirit—also known as *Yankee ingenuity*—very few Western *corporations* actually practice jugaad today.[10] Yet jugaad was once a big part of Western innovation too. It was the flexible mindset of jugaad-style innovators that catalyzed growth in Western economies like that of the United States during the Industrial Revolution.

For instance, in 1831 a self-educated Virginian farmer named Cyrus McCormick introduced his newly invented mechanical grain reaper. The reaper promised to free farm workers from back-breaking labor and address the problem of scarce food supplies that plagued his community. When McCormick was born in 1809, over 80 percent of Americans were dependent on agriculture for their livelihood (by 1970 that figure had dwindled to just 4 percent).[11] In early nineteenth-century America, farmers harvested grain crops by hand, requiring many laborers to complete the task. Cyrus McCormick's father had wanted to make life easier for his fellow farmers. He spent twenty-eight years trying to develop a machine that could automate grain harvesting, but

he gave up after multiple unsuccessful attempts. When his son Cyrus was barely twenty-two, he took over his father's invention and tinkered with the machine to make it work. In his family barn, which served as a makeshift workshop, he spent many months tweaking the design for an automated grain-harvesting machine, using limited resources and hand-made components. Finally, in 1831, he came up with a workable and elegant version of the mechanized reaper, capable of harvesting more grain than five men could gather using the earlier cradles.[12]

The reaper wasn't even Cyrus McCormick's first invention. Despite little education, at age fifteen he had invented a lightweight grain cradle that could cut and stack grain more efficiently. A few years later he developed two new types of plow. Nineteenth-century America—struggling with a scarcity of resources, yet fertile with opportunities—teemed with jugaad entrepreneurs like Cyrus McCormick whose clever inventions brought great benefits to the society at large.[13]

Yet Cyrus McCormick's most famous jugaad invention—the mechanized reaper—wasn't an instant commercial success. His fellow farmers, accustomed to manual methods of harvesting, were initially skeptical about the usefulness of this unfamiliar machine. McCormick struggled for years to sell his machines. He found success through further flexible jugaad thinking: pioneering the practice of word-of-mouth marketing, he got his first few customers to recommend his reaper to other potential customers. Eventually, sales of his reapers picked up, and McCormick shifted production to a factory in Chicago. His machines started selling well and dramatically improved agricultural practices across the country. In the process, McCormick also laid the groundwork for many innovative sales and marketing practices—like assessing customers' credit-worthiness and offering a "money-back guarantee"—that are now standard practices of Western businesses across industries. McCormick proved to be not only an ingenious technical inventor but also a great *business model* innovator. And although McCormick's life was filled with adversity—from factory fires to patent disputes—he always bounced back with resilience. McCormick's jugaad inventions enabled scores of American workers to shift from farming to factory work—thus accelerating the Industrial Revolution.[14]

Among the many early American jugaad innovators, the best-known may well be Benjamin Franklin. Franklin experienced scarcity and learned about the virtue of frugality firsthand, growing up in a large Puritan family of nine brothers and seven sisters.[15] When he was just ten years old, Franklin left school and started working in his father's candle and soap shop to help support his family. Early on, Franklin developed a knack for using limited resources to devise ingenious and frugal solutions to tackle the everyday problems of his contemporaries. Franklin's legendary ingenuity was fueled by his genuine empathy for his fellow citizens. One of his most practical inventions was the Franklin stove.[16] During the eighteenth century, homes in the United States were primarily heated by inefficient fireplaces that spewed smoke while much of the heat they generated escaped up the chimney. They were also hazardous, as their sparks could trigger fires that quickly devoured wood-built homes.

Franklin's jugaad innovation to tackle this problem was a new type of stove with a simple hooded enclosure in the front and an air box in the rear. The new stove and its reconfiguration of the flues enabled a more efficient fire, one that consumed 75 percent less wood and generated twice as much heat.[17] The Franklin stove delivered "more with less." An early advocate of open source technology, Franklin turned down the patent offered for his original design, stating that altruism rather than profit was his driving motive for developing the efficient stove. He wanted all Americans to benefit from his invention. In fact, Franklin patented *none* of his inventions. In his autobiography, he wrote that "as we enjoy great advantages from the inventions of others, we should be glad of an opportunity to serve others by any invention of ours; and this we should do freely and generously."[18] As a serial jugaad entrepreneur, his approach to innovation was always inclusive: his ingenious but simple inventions—including the lightning rod, bifocals, and a carriage odometer—enhanced lives throughout the colonies.

America's founding fathers, as well as its creative farmers, industrial pioneers, and scientific explorers in the nineteenth and early twentieth centuries—from Ben Franklin to Cyrus McCormick to the Wright brothers—were historic practitioners of jugaad in the West.

These ingenious entrepreneurs spurred the Industrial Revolution in Western nations, building a strong foundation of economic leadership that lasted for decades. In the twentieth century, however, especially after World War II, Western nations gradually lost touch with this jugaad spirit as they matured into postindustrial economies and became attached to a systematized, predictable way of life and work. Improvised ingenuity—the essence of jugaad—took a back seat to a more formally structured approach to innovation.

HOW THE WEST LOST ITS JUGAAD

In the twentieth century, as North American and European economies expanded, Western corporations began to institutionalize their innovation capabilities, creating dedicated R&D departments and standardizing the business processes needed to take their ideas to market. They focused on *managing* innovation, just as they managed any other business activity. This industrialization of the creative process led to a *structured* approach to innovation with the following key characteristics: big budgets, standardized business processes, and controlled access to knowledge.

But this structured innovation approach, which helped Western firms become highly successful in the second half of the twentieth century, has three clear limitations in the fast pace and volatility of the twenty-first century: it is too expensive and resource consuming, it lacks flexibility, and it is elitist and insular.

The Structured Approach Is Too Expensive and Resource Consuming Western firms have come to believe that their innovation system—like any industrial system—will generate more output (inventions) if fed more input (resources). As a result, the structured innovation engine is capital intensive. It requires an abundant supply of financial and natural resources at a time when both are increasingly scarce. The approach is designed to deliver "more with more"—that is, firms charge customers a hefty premium for overengineered products

that are expensive to develop and produce. For instance, the thousand companies in the world that invest the most in innovation—many of which are Western firms—spent a whopping $550,000,000,000 (yes, that's US$550 billion!) on R&D in 2010 alone.[19] But what did they get in return for all this expense? Not much, according to research conducted by the management consultancy Booz & Company. They found that the three Western industries that spend the most on R&D—computing and electronics, healthcare, and automotive—struggle to generate a steady stream of groundbreaking inventions, despite their hefty R&D investments. Hence there is *a weak correlation* between how much money your firm spends in R&D and how well it performs in terms of developing and marketing products that generate a significant financial return. To put it bluntly, *money can't buy innovation*. Fittingly, a Booz & Company report carries a photograph of a dejected-looking CEO wearing a T-shirt that reads: "We spent $2 billion on R&D and all we got was this lousy T-shirt." The caption illustrates well the frustrations of Western corporate leaders facing, on the one hand, huge financial constraints, and on the other, immense pressures from shareholders to deliver growth.[20]

The pharmaceutical industry is one sector where the "bigger is better" R&D strategy is clearly running out of steam. Big Pharma's spending on R&D ballooned from $15 billion in 1995 to $45 billion in 2009.[21] Yet the number of new drugs launched annually has dropped by 44 percent since 1997.[22] This is especially bad news for Big Pharma, given that between 2011 and 2016 drugs worth a whopping $139 billion are set to go off patent.[23] To further complicate things, Big Pharma in the United States is facing a growing backlash from politicians and the public as health care costs spiral out of control, even as fifty million Americans continue to lack basic health insurance.

The drug industry is not an exception. The U.S. auto sector spent $16 billion on R&D in 2007 alone.[24] But American automakers nevertheless trail their Japanese, Korean, German, and even Chinese and Indian rivals, as frugal consumers worldwide clamor for more compact, fuel-efficient, and environmentally friendly cars. The U.S. market share of the Big Three—Chrysler, General Motors, and

Ford—has steadily declined, from 70 percent in 1998 to 44.2 percent in 2009.[25] In December 2008, the cash-strapped automakers asked the U.S. government for a $34 billion bailout to cover employee health care expenses and prevent bankruptcy and massive layoffs.[26] Since December 2009, the U.S. government has given $82 billion in aid to the Big Three—including $62 billion to General Motors and Chrysler alone (both carmakers filed for bankruptcy protection).[27]

The Structured Approach Lacks Flexibility With so much money invested in R&D, Western firms have become risk averse in their approach to innovation. They have implemented standardized business processes such as "Six Sigma" (an integrated set of management techniques designed to decrease production defects and increase operational efficiency by standardizing processes) and "stage gate analysis" to manage and control their innovation projects. These structured processes were expected to drastically reduce uncertainty—and risk of failure—from the entire innovation process and make R&D projects more predictable in both execution and outcomes. But these structured business processes and methods are unfit to deliver the agility and differentiation that enterprises need in a fast-paced and volatile world.

Take Six Sigma—the well-known management strategy pioneered by Motorola in 1986 and the corporate dogma of leading Fortune 500 firms such as GE and Boeing. Six Sigma is a set of practices designed to improve quality by eliminating defects. With a Six Sigma process implemented, there is a statistical expectation that 99.99966 percent of the products manufactured will be free of defects. Six Sigma works marvelously when you are seeking to institutionalize "sameness," and this comes in handy when you are mass-producing widgets in a predictable environment. But Six Sigma is like a straitjacket: once you get in, you are stuck, and when things start to change, you can't move (let alone dance).[28]

Built around stable and predictable processes, programs like Six Sigma cannot enable the rapid change that companies need as they seek to mass customize products and services, satisfy increasingly diverse

and finicky customers, and keep up with technology shifts. Worse, the orthodox Six Sigma culture weeds out "positive deviance"—the uncommon strategies used by those pioneering employees in a company who use unconventional and counterintuitive methods to solve vexing business problems that can't be addressed using traditional approaches.[29] But, as Malcolm Gladwell points out in *Outliers*, positively deviant behavior and ideas are what actually drive game-changing innovation.[30] That explains why George Buckley, CEO of 3M—where an outlier named Art Fry invented the now-indispensable Post-it® Notes by sheer serendipity—rolled back several Six Sigma initiatives at 3M in a bid to revive innovation in the firm. Buckley points out: "Invention is by its very nature a disorderly process. You can't put a Six Sigma process into that area and say, Well, I'm getting behind on invention, so I'm going to schedule myself for three good ideas on Wednesday and two on Friday. That's not how creativity works."[31]

The Structured Approach Is Elitist and Insular Throughout the twentieth century, Western firms built large R&D labs that employed hundreds of top scientists and engineers, based on a belief that "knowledge is power" and that controlling access to it was key to success. Thus innovation became an elite activity controlled by a few high priests: engineers and scientists working under conditions of secrecy in in-house labs close to headquarters. Only these chosen few were invited into the R&D department and given the resources and permission to innovate. Any new knowledge they generated was closely guarded. Collaboration with other employees—let alone outsiders—was shunned. The assumption was that to dominate markets through innovation one needed two things: top-of-the-line technology and ownership of the best intellectual property, both of which could be bought with enough money. However true that assumption might have been in an earlier industrial era, it is far less valid now. Part of the old belief was that only a bunch of smart Ph.D.s could *invent* new things. But in today's consumer-driven economy we know that it's more important to *commercialize* technology, which requires knowledge of fields such as design and marketing—skills that

engineers and scientists may not necessarily have.[32] As Bob McDonald, CEO of Procter & Gamble, explains: "For us, innovation is not invention. It's the conversion of a new idea into consumer delight and, ultimately, into revenues and profits. If an idea or technology cannot be successfully commercialized, it's not an innovation."[33]

Further, in an interconnected world powered by social media, the intellectual property that one can buy isn't the only source of new ideas. Finding, sharing, and integrating globally dispersed knowledge among all levels of employees is just as important, if not more so. Consider this statistic: as of this writing, every Facebook user creates, on average, ninety pieces of content per month, contributing to more than thirty billion pieces of shared content—ranging from family photos to web links to posts—across the Facebook social network.[34] The power of innovation has shifted from the professional class to the masses. Creativity has been democratized—thanks to social media tools like Facebook. As strategy consultant and author Gary Hamel says, "The underlying principles on the Web of natural hierarchy, transparency, collaboration and all the rest—those characteristics are going to have to invade management. The idea of a hierarchy that fundamentally empowers the few and disempowers the many is more or less dead."[35]

Yet top-down R&D systems are often unable to open up and integrate such bottom-up input from employees and customers. Younger, creative employees use new technologies like social media in order to brainstorm ideas, creating a virtual watercooler. Structured organizations often find it hard to integrate these methods of innovation into their business model. The chief information officer of a large engineering services firm told us, "Many of our younger employees brainstorm new ideas on Facebook. As a result, Facebook has become the virtual brainstorming place where people gather and hatch ideas. I really don't know how to funnel those ideas back into our corporate R&D systems."

Bottom line: the processes, systems, and mindsets that underpin the structured approach to innovation are now failing. Although in years past corporations were able to survive and even thrive with this approach, it was designed to help them compete and win in a relatively

stable, slower, and predictable world of abundance—one that no longer exists. Today's highly complex and turbulent business environment demands a new approach to innovation and growth—one that is frugal, flexible, and participative.

COMPLEXITY STRETCHES WESTERN FIRMS' ABILITY TO INNOVATE

In a global survey conducted by IBM in 2010, 79 percent of the 1,500 CEOs surveyed said that they anticipated greater complexity in the future environment.[36] Worryingly, fewer than half of these CEOs believed that their firms were prepared to respond creatively to this increasing complexity. The main reason is that Western firms' structured approach to innovation is ill-equipped to help them innovate *faster, better, and cheaper* as they seek to cope with five major components of complexity—scarcity, diversity, interconnectivity, velocity, and breakneck globalization.

Scarcity Even as Western economies struggle to emerge from the global recession, access to financial capital remains restricted for small and midsize companies—which account for two-thirds of job creation in the United States—while consumers struggle to obtain loans from risk-averse banks.[37] For instance, America's consuming middle class, which accounts for two-thirds of national spending and forms the bedrock of the U.S. economy, is feeling the pinch. Between 2000 and 2010, the inflation-adjusted income of middle class American households dropped by 7 percent. In late 2011, an astounding 46.2 million Americans (or 15 percent of the U.S. population) were living in poverty and nearly 50 million lacked health insurance.[38] Not surprisingly, in 2011 only 65 percent of Americans believed their children would be able to achieve the American Dream—down from 69 percent in 2008.[39]

In times like these, it's unrealistic to expect Western governments to come to the rescue of their citizens, as they are feeling the squeeze as well: U.S. public debt, for instance, has increased by over $500 billion, on

average, every year since 2003. As of early August 2011, the total public debt of the United States was a whopping $14.34 trillion dollars.[40] In the UK, public sector borrowing skyrocketed to £175 billion (US$253 billion) or 12.4 percent of GDP in 2009—the highest level of borrowing among all developed nations.[41] Heavily indebted Western governments have no choice but to cut down on public services, and this will only further hurt already stretched Western consumers.

Meanwhile, natural resources like oil and minerals are becoming more scarce and consequently more expensive. While everyone frets about the escalating price of oil, another precious resource—water—is also becoming increasingly scarce. One out of three U.S. counties faces a risk of water shortages in coming decades, and fourteen states, including California and Texas, face an extreme threat to their water sustainability.[42]

Further, the outlook of Generations Y and Z marks a significant change in both the workforce and the consumer base. These frugal and environmentally conscious young consumers are more comfortable working with scarcity and seem to instinctively follow jugaad in their daily lives. They innately appreciate the need to do more with less, having experienced firsthand the worst economic times since the Great Depression. The MacArthur Research Network on Transitions to Adulthood and Public Policy conducted five hundred interviews with twenty-somethings on their cost-conscious lifestyle and concluded that their "frugality could last a lifetime."[43]

All three trends—financially constrained consumers and governments, dwindling natural resources, and greater numbers of frugal Gen Y and Z consumers wanting low-impact environmental products— have put scarcity on the agenda for Western companies, forcing them to find frugal ways to grow with less. The raw materials necessary to make new products will cost more in the future, and consumers' financial constraints will drive them to look for low-cost products that still deliver results in an eco-friendly way.

Diversity The workforce of most Western companies is now more diverse than ever before. The Gen Y (also known as the Millennials) and

Gen Z—with their distinctive values and expectations—are now joining Generation X and the baby boomers at work. The COO of a large Silicon Valley–based tech firm told us, "For the first time in my life, I now manage workers across four generations—which is more difficult because we have to accommodate the diverse values and expectations of our multigenerational workforce."

Meanwhile, traditionally homogeneous markets are now more fragmented, as consumers from minority groups seek solutions tailored to their unique needs. For instance, Hispanics already account for more than one-third of California's population and are expected to become a majority in that state by 2042.[44] As a result, corporate leaders have to learn to reconcile the varying values and expectations of their diverse workforce and consumer communities they serve. Unfortunately, the structured approach to innovation—rigid, insular, elitist, and promoting *uniformity*—is limited in its ability to deal with a world of diversity.

Interconnectivity Cloud computing, mobile technologies, and social media have created new ways for companies to connect and engage deeply with their current and prospective customers and partners alike. Indeed, the United States is turning into what Daniel Pink calls a "free agent nation," one in which a growing number of professionals are escaping "corporate fortresses" by leveraging professional social networks like LinkedIn to freelance their skills.[45] Technology has fostered a growing need for creative freedom among employees and citizens by forcing CEOs to open up their business models and organizational structures to make the most of a connected society and workforce. Specifically, the rigidity of the structured approach limits the use of more flexible ways of innovating that involve groups *outside* the firm, such as consumers and partners. And the insularity of the structured approach limits the involvement in innovation—even *within* the firm—of employees who are not strictly tasked with doing R&D.

Velocity The speed of change is increasing on multiple fronts—technological, market, and competitive. In particular, product life cycles are getting shorter, putting pressure on corporations to launch new products

faster than ever and to keep ever-more-demanding consumers satisfied. For instance, the Apple iPad 2 was released even before there was viable competition for the iPad 1. And in the era of Twitter and Facebook, the reputations of companies (and governments) can be destroyed at lightning speed—as evidenced by Wikileaks. This accelerating pace—and the associated ambiguity about what the future holds—forces CEOs to delegate decision making to frontline employees, to respond swiftly to unexpected opportunities and challenges in their environment. But the insularity and rigidity of the structured approach to innovation limits the extent to which CEOs can use more decentralized approaches that rely on empowered employees to cope with changes effectively and quickly.

Breakneck Globalization The rapid rise of emerging markets like India and China magnifies the impact of scarcity, diversity, interconnectivity, and accelerating change. For instance, the Chinese middle class, already three hundred million strong, is expected to double over the next decade. More consumers worldwide entails a greater strain on existing resources and hence a dwindling of resources available to Western firms. For example, India and China together are expected to contribute to over 50 percent of the increase in global energy demand between 2010 and 2035.[46] In 2035, China will be consuming nearly 70 percent more energy than the United States. Meanwhile, by 2020 one global worker in four will be Indian. Accenture, a U.S. management consulting firm, already employs more than sixty thousand workers in India, making this its largest workforce in the world. A more global workforce means both more competition for firms that operate primarily in Western markets and a more diverse workforce at Western multinationals expanding into emerging markets. More competition from emerging market firms will place greater pressure on Western firms to innovate, especially for emerging market consumers (who are likely to be more frugal). And more diversity in the workforce will drive Western firms to be more flexible in their organizational structures and processes to accommodate diverse values, cultures, and expectations. The structured approach to innovation isn't well suited to dealing with these pressures of globalization. Its expensive, even profligate, nature

limits its ability to deal with increasing scarcity. And its rigidity and insularity limit its ability to deal with diversity and velocity, on the one hand, and to fully exploit the potential of interconnectivity, on the other.

Deep scarcity, major demographic shifts, rapid technological change, and accelerating globalization are creating the most complex business environment since the Industrial Revolution. In this context, the old models of innovating are breaking down. As we mention earlier, fewer than half of the 1,500 global CEOs surveyed in the IBM poll believe that their firms are prepared to respond creatively—and effectively—to this escalating complexity.

The Western innovation engine has become too rigid, insular, and bloated to remain effective. It consumes a lot of resources and makes a lot of noise, but—for many companies—it produces little of much significance. If this condition of dysfunction continues much longer, there is a risk that it will cripple the West even as it emerges from tough economic times and seeks to grow.

It is clear that the West must build a new innovation engine that allows it to innovate faster, better, and cheaper. To do so, Western firms must find new sources of inspiration. Emerging markets are a great place to start.

SEARCHING FOR THE HOLY GRAIL OF INNOVATION

When we began our research in 2008, we predicted that the so-called BRICs—Brazil, Russia, India, and China—might be a good place to look for a new approach to innovation.[47] We had each come to this realization in our respective professions—academia, consulting, and media—and this interest brought us together in the shared quest that has culminated in this book.

In early 2008, Simone began extensive background research and ethnographic work for a documentary film series exploring innovation in India. During her work she came across Navi, then an analyst at Forrester Research, and asked him to act as an innovation consultant to the film series. Navi had written extensively about—and consulted

on—innovation in both Western and emerging markets. In late 2008, Navi decided to focus all his attention on emerging markets and joined Jaideep at the University of Cambridge's Judge Business School to set up the Centre for India & Global Business. Jaideep, after spending most of his academic career studying innovation in the West, had also begun to turn his attention to the increasingly important role of emerging markets in the global innovation ecosystem.

When we began our quest, the emerging economies had grown in the previous decade from one-sixth to a quarter of the world economy. Even in 2008, at the height of the global recession, India and China were growing at 7 percent and 9 percent, respectively. Goldman Sachs, among others, had predicted that these nations would continue to grow between 3 percent and 5 percent per year until 2050, dominating the world economy for the next forty years.[48]

The BRIC economies' vastness (both geographically and demographically), their diversity, and their pervasive scarcity of resources all add up to a challenging state of affairs that would trouble even the most seasoned business leaders. However, the very fact that the BRIC nations have been grappling with complexity and instability for so long seems to give them an edge and a kind of immunity in volatile and adverse circumstances. What is in the immune system of these emerging economies that makes them so resilient? And what might business leaders in these countries be able to teach their counterparts in the West?

To find the answers we studied the *mindset* and *principles* of innovators who were driving growth in the BRICs. If Western leaders could acquire a similar mindset and principles, then they could potentially develop the same immunity to complexity—and quickly identify emerging business opportunities in their own mature economies.

Among the BRICs, we chose to study India first because, after China, it is the fastest-growing economy in world. Further, many—including Goldman Sachs and Ernst & Young—predict that India not only will economically outpace China soon but will continue to grow faster than the other BRICs for several decades to come.[49] Most important, India is as complex as they come. The country faces scarcity

on a grand scale across the board: from water, food, and energy (over five hundred million Indians lack regular electricity) to access to education and health care. Its chaotic democracy is characterized by a Kafkaesque bureaucracy and mind-boggling diversity; its population of 1.2 billion is expanding at 1.3 percent a year.[50] Despite all the chaos and complexity, the Indian economy is growing strongly in challenging economic times. If Indians have managed to grow "in spite of complexity," then there must be something there worth learning from.

On our many trips to India we met dozens of grassroots entrepreneurs and visited over a hundred enterprises, large and small. What we saw amazed us. The country is bursting with ingeniously simple yet effective innovations. After more than three years of extensive field research, searching for the holy grail of innovation all over the country, we came to a realization: all the thrifty innovators we encountered shared a unique mindset—the jugaad mindset.

Expanding our research to other countries, we found that the entrepreneurial spirit of jugaad, far from being a purely Indian thing, is really universal. Other emerging markets, from Latin America to Africa to Eastern Europe to Asia, have their own versions of jugaad. (In our companion website, JugaadInnovation.com, we showcase several of these jugaad innovators.) Because these emerging economies share the same adverse conditions that drive jugaad in India, they also excel at this improvisational and frugal art of responding to complexity. What then are the shared, underlying principles of this jugaad mindset?

THE SIX PRINCIPLES OF JUGAAD—AND THEIR BENEFITS TO THE WEST

We found that jugaad can be distilled into six guiding principles, which anchor the six practices of highly effective innovators in complex settings like emerging economies. The six principles are:

- Seek opportunity in adversity.
- Do more with less.

- Think and act flexibly.
- Keep it simple.
- Include the margin.
- Follow your heart.

Collectively, these six principles of jugaad help drive resilience, frugality, adaptability, simplicity, inclusivity, empathy, and passion, all of which are essential to compete and win in a complex world. Adopting these principles could also help Western firms innovate and grow in a highly volatile, hypercompetitive environment.

Seek Opportunity in Adversity Jugaad entrepreneurs perceive harsh constraints as an invitation to innovate. Modern-day alchemists, they transform adversity into an opportunity to bring value to themselves and their communities. For instance, Kanak Das, who lives in a remote village in northeast India, grew tired of riding his bicycle on roads full of potholes and bumps. Rather than complain, he turned this constraint to his advantage by retrofitting his bicycle with a makeshift device that converts the shocks it receives into acceleration energy—allowing his bicycle to run faster on bumpy roads. Similarly, Enrique Gómez Junco, a Mexican engineer turned jugaad entrepreneur who founded Optima Energía, was unfazed by the skepticism he faced when he first attempted to convince risk-averse companies to buy his sustainable energy solutions. Instead, this adversity motivated him to adapt his business model and come up with a compelling new value proposition—that is, customers can buy his energy savings solutions with no up-front payments—which enabled him to convert those initially skeptical companies into loyal customers. (You will learn how Junco reframed adversity to achieve a breakthrough in Chapter Two.)

This ability to reframe adversity as a source of innovation and growth is vital for any organization to survive and thrive. And as we discovered, some of these alchemists also work for large Western corporations such as 3M. For example, in Chapter Two we show how 3M is capturing big growth opportunities in an extremely adversarial

business environment by rekindling and unleashing the jugaad spirit of all its employees.

Do More with Less Jugaad innovators are highly resourceful in the face of scarcity. Unlike many Silicon Valley entrepreneurs, raising capital is the least of their worries. The practitioners of jugaad work with what they've got. Doing more with less is in striking contrast to the "bigger is better" R&D approach used in the West—an approach that has been unsuccessful in making basic services like education and health care affordable to more people. Indeed, this frugal principle can help firms in both emerging and developed economies optimize the use of scarce financial and natural resources while delivering high value to a greater number of customers.

In Chapter Three you will meet two jugaad entrepreneurs—Gustavo Grobocopatel of Los Grobo (Argentina) and Sunil Mittal of Bharti Airtel (India)—who have developed frugal business models to cost-effectively deliver agricultural and telecom services, respectively, to the masses. Similarly, you will learn how PepsiCo is reinventing its business model as an affordable and sustainable provider of nutritious foods and beverages—in a proactive response to both the growing consumer demand for healthy food and the scarcity of natural resources like water.

Think and Act Flexibly Jugaad is the antithesis of structured approaches such as Six Sigma. Jugaad entrepreneurs' flexible mindset constantly questions the status quo, keeps all options open, and transforms existing products, services, and business models. Unconstrained by structured processes, jugaad innovators can quickly respond to unexpected changes in their environment. Jugaad innovators don't just think outside the box: they create whole new boxes. Their nonlinear thinking often yields breakthrough ideas that turn conventional wisdom on its head and help to shape entire new markets and industries. As we explain in Chapter Four, that's the case with Ratan Tata, chairman of the Tata Group, who foresaw a big market for extremely affordable cars and went on to successfully launch the $2,000 Nano in 2009—proving

wrong those skeptics who had belittled his vision as a pipe dream. When the original plans failed to deliver sales, leaders at Tata Motors (the automotive unit of Tata Group) had to think on their feet and improvise new manufacturing, distribution, and marketing strategies for the Nano.

Jugaad innovators also *act* flexibly. In Chapter Four we describe how Zhang Ruimin, the entrepreneurial CEO of Haier, a fast-growing Chinese appliance manufacturer, has made Haier's organizational structures flat, thus empowering frontline employees to swiftly sense and respond to changes in customer demand and innovate faster, better, and cheaper than rivals. Closer to home, we explain how the New York Times Company is exhibiting flexible thinking by proactively embracing social media and mobile technologies, rather than being disrupted by them.

Keep It Simple Jugaad isn't about seeking sophistication or perfection by overengineering products, but rather about developing a "good enough" solution that gets the job done. Creative simplicity is jugaad's key principle. Western firms that are engaged in an "arms race" to out-innovate each other by cramming more technology and features into their products and services should make simplicity a key tenet of *their* innovation projects—just as entrepreneurs in emerging markets do. For instance, the open-source software company Ushahidi has developed an elegantly simple solution—the Ushahidi Platform—that relies on mobile SMS (text messaging) to coordinate bottom-up responses to cataclysmic events such as hurricanes, earthquakes, or epidemic outbreaks. The Ushahidi Platform was pioneered in Africa and is now being widely deployed worldwide—including in the United States—as a simple yet highly effective crisis management tool. In Chapter Five you will discover how large Western companies such as GM, Philips, and Siemens, as well as next-generation companies such as Google and Facebook, are using simplicity to ensure that their solutions are accessible and easy-to-use by a large number of users.

Include the Margin Western firms typically vie to serve mainstream customers; in contrast, jugaad entrepreneurs intentionally seek out

marginal, underserved customers and pull them into the mainstream. Such entrepreneurs conjure up radically affordable solutions to meet the needs of these underserved markets. Their inclusive business models engage low-income and nontraditional communities, not as passive consumers but as active value cocreators. For instance, Dr. Liu Jiren, chairman and CEO of Neusoft, China's largest IT solution and service provider, is concerned about the health of eight hundred million Chinese living in rural areas who, says Dr. Liu, are going to "get older and sicker before they get wealthier."[51] Dr. Liu's genuine concern for China's marginal segments led him to develop inclusive technology solutions—such as telemedicine applications—that deliver affordable health care to millions of rural Chinese.

Similarly, Abhi Naha has founded Zone V, a company that seeks to empower the 284 million blind and partially sighted people worldwide by providing them with cellphones specially designed to meet their particular needs. Naha's aspiration is to build a world in which "lack of sight doesn't mean lack of vision."[52] In Chapter Six we explain why and how Procter & Gamble is fundamentally shifting its business model to serve the "un-served and under-served consumers"—marginal segments that increasingly include middle-class consumers in the United States whose purchasing power is being squeezed by the lack of growth in their income over the last decade.

Follow Your Heart Jugaad innovators do not rely on focus groups or formal market research to decide what products to make—nor do they worry about how investors will react to their new product strategies. They know their customers and their products intimately—and ultimately, they trust and follow their hearts. Specifically, jugaad entrepreneurs employ intuition, empathy, and passion—qualities that are increasingly just as important as analytical thinking in navigating a global environment that is ever more diverse, interconnected, and unpredictable. For instance, Kishore Biyani—founder of Big Bazaar, one of India's largest and most successful retail chains—did not use management consultants to validate his idea of launching retail stores that look, feel, and even smell like chaotic street bazaars. When he

launched his new store format, he trusted his intuition—fired by his empathy for Indian consumers—more than any analysis. By intuitively sensing the latent needs of consumers in a high-aspiration society like India, Biyani conjured up an innovative retail model that is hard for rivals to replicate.

Similarly, Steve Jobs was the prototypical jugaad innovator in the West. He always heeded his intuition rather than relying on analytical thinking to innovate and grow. The result, as we explain in Chapter Seven, was a series of disruptive inventions such as the iPad, a product that consumers, analysts, and media initially were convinced had no market.

The heart is also the seat of passion. Jugaad entrepreneurs such as Diane Geng and Sara Lam, cofounders of the Rural China Education Foundation (RCEF), are motivated not by money or an "I want to go IPO and become a millionaire" mentality. Rather, as we detail in Chapter Seven, Geng and Lam were driven by a deep passion to make a difference in their communities. It was this passion that led them to develop a radically new approach to providing rural youth in China with a quality education. Also, a growing number of Western firms now recognize that the best way to motivate—and retain—knowledge workers is not by giving them bonuses, but by giving them the freedom to pursue projects that they are passionate about. In Chapter Seven we describe how frog, a global design and innovation consultancy, launched an initiative called Centers of Passion that lets its creative workers worldwide initiate or join projects in which they find a deep sense of meaning and purpose—well beyond sheer intellectual or even emotional satisfaction.

JUGAAD: A COMPLEMENT TO STRUCTURED INNOVATION

As Western firms strive for continued growth, they have much to gain from adopting and practicing these six principles of jugaad—seeking opportunity in adversity, doing more with less, thinking and acting flexibly, keeping it simple, including the margin, and following the

heart. For too long, the Western model of innovation has been like an orchestra: top-down, rigid, and driven by upper-level employees. This model works well in a stable world of plentiful resources. But given the complex and unpredictable business environment that Western companies are about to face in the coming years, they need an alternative approach, one more akin to a jazz band: bottom-up, improvisational, fluid, and collaborative while working within a framework of deep knowledge. Jugaad represents that alternative.

It's important to note, however, that jugaad isn't relevant for all situations and contexts. In particular, jugaad shouldn't *replace* Western companies' existing structured approach to innovation; rather, jugaad should *complement* it. In this book, we argue that jugaad is an important tool that Western companies can add to their existing innovation toolkit. We explore each of the underlying principles of jugaad and show how they can fortify a structured approach to innovation and achieve growth by adding frugality and agility.

In particular, in Chapter Eight we discuss the advantages and limits of jugaad innovation, and the specific contexts in which jugaad is particularly effective (that is, complex and volatile environments). We describe how Western companies can mesh the agile and resilient spirit of jugaad with the more structured approach to innovation. For leaders of Western companies entrenched in a structured approach to innovation, the idea of adopting jugaad can seem daunting. We make that adoption process easier by helping corporate leaders prioritize the specific jugaad principles they need to adopt most urgently. We do this by matching the benefits of each of the six principles with the needs and context of organizations.

To illustrate how Western firms can accelerate their adoption of jugaad, we describe how a large western multinational—GE—is attempting to integrate a jugaad approach into its structured innovation approach steeped in Six Sigma practice. In sum, we show that jugaad can enrich the innovation toolkit of Western firms so they can effectively grow and succeed in a world of complexity and scarcity.

In our companion website (JugaadInnovation.com) you will find additional tools and roadmaps for prioritizing—and accelerating—the adoption of jugaad principles in your own organization.

A GROUNDSWELL JUGAAD MOVEMENT IS GROWING IN THE WEST

Over the last three years we have drawn on our business experience, academic training, and multimedia expertise to document and understand how emerging market innovators—from grassroots entrepreneurs such as Mansukh Prajapati to pioneering CEOs like Ratan Tata—think and act. We have written extensively about these innovators—and their jugaad principles—in our blog on the *Harvard Business Review* website. We have featured them in the PBS documentary film series *Indique: Big Ideas from Emerging India*.[53] Finally, we have drawn on the principles of jugaad to help organizations around the world implement them in order to innovate better, faster, and cheaper. The response to these efforts from readers, corporations, viewers, and clients around the world has been overwhelming.

Western leaders—inured to a world of relative abundance and used to operating for so long in a relatively predictable environment—have the most to learn from jugaad. We have consulted with Western companies that have begun to implement the principles of jugaad—companies that enjoy a culture that promotes openness and adaptability and that have harnessed the creativity of employees, customers, and partners alike. These companies have found that jugaad has given them the agility needed to sense and respond to rapid shifts in the highly volatile environments in which they operate—and deliver more value to customers at less cost.

Although it's been a long time since the previous, nineteenth-century era of jugaad in the West, we may now be coming full circle, as some firms begin to appreciate and adopt its principles again. In the coming chapters, we will illustrate how forward-thinking Western companies across diverse sectors—such as 3M, Apple, Best Buy, Facebook, GE,

Google, IBM, PepsiCo, Procter & Gamble, Renault-Nissan, and Wal-Mart—have already adopted the principles of jugaad, to their great advantage. These vanguard companies are combining the frugal and resilient spirit of jugaad with more structured traditional approaches to innovation to generate breakthrough growth.

But corporate leaders are not the only ones rediscovering the spirit of jugaad in the West. In Chapter Nine, we describe how a groundswell movement—led by creative citizens, forward-thinking entrepreneurs, venture capitalists, and non-profit organizations—is gaining momentum across Western societies. And increasingly, governments and universities are supporting such a jugaad ecosystem as well. For instance, the White House Office of Social Innovation and Civic Participation, set up by President Obama in early 2009, is enabling grassroots entrepreneurs across America to devise bottom-up solutions to address pressing socio-economic issues in their local communities. Similarly, Stanford University's Entrepreneurial Design for Extreme Affordability program is training future engineers and business leaders in how to develop high-quality products at low cost—such as an infant warmer that costs less than 2 percent of the cost of a traditional incubator—for use in both emerging markets and the United States. This emerging ecosystem not only creates an environment for jugaad innovators to thrive in but also helps Western firms in their own efforts to adopt jugaad. By joining this *external* groundswell movement, Western firms can accelerate their *internal* adoption of jugaad—and profit handsomely from it.

In the rest of this book, we present a vision of how whole swaths of Western economies—from education and healthcare to energy and manufacturing to retail and financial services—can be rejuvenated by embracing jugaad. At the heart of that vision, however, lie those six fundamental principles of jugaad *innovation*. We turn to an exploration of each of these principles in the following chapters.