

CREATIVE

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**THE DNA OF
SUSTAINED INNOVATION**

GARY P. PISANO

CREATIVE CONSTRUCTION

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Contents

[Cover](#)

[Title Page](#)

[Copyright](#)

[Dedication](#)

[Preface and Acknowledgments](#)

[INTRODUCTION](#)

[Innovation's Catch-22](#)

PART I: CREATING AN INNOVATION STRATEGY

1 BEGINNING THE JOURNEY

[The Discipline and Focus of an Innovation Strategy](#)

2 NAVIGATING THE ROUTE

[Creating Your Innovation Portfolio](#)

3 WHATEVER HAPPENED TO BLOCKBUSTER?

[Competing Through Business Model Innovation](#)

4 IS THE PARTY REALLY OVER?

[Why You Should Not Always Eat Your Own Lunch](#)

PART II: DESIGNING THE INNOVATION SYSTEM

5 VENTURING OUTSIDE YOUR HOME COURT

[Search: Discovering Novel Problems and Solutions](#)

6 SYNTHESIS

[Bringing the Pieces Together](#)

7 WHEN TO HOLD 'EM AND WHEN TO FOLD 'EM

[Uncertainty, Ambiguity, and the Art and Science of Selecting Projects](#)

PART III: BUILDING THE CULTURE

8 THE PARADOX OF INNOVATIVE CULTURES

Why It's Not All Fun and Games

9 LEADERS AS CULTURAL ARCHITECTS

Reengineering the Cultural DNA of an Enterprise

10 BECOMING A CREATIVE CONSTRUCTIVE LEADER

About the Author

Praise for *Creative Construction*

Bibliography

Notes

Index

To Alice
For never letting me take myself too seriously

Preface and Acknowledgments

Larger enterprises are rarely viewed as fountains of innovation. Over the past several decades, a barrage of writings, news stories, and lectures has conditioned us to accept as a “law” that scale stifles innovation. As enterprises grow, the narrative goes, they inevitably suffer organizational sclerosis and become feeble shadows of their once-dominant former selves. They are helpless in the wake of “disruptive” innovation attacks by nimble, entrepreneurial firms. It is a depressing story that, unfortunately, has unfolded many times. And yet it does not have to be this way.

Creative Construction challenges the dogma that, as enterprises grow, they inevitably lose their capacity for transformative innovation. Over my thirty-year career, I have worked with companies across the full-size spectrum—from the tiniest start-ups to the largest corporations on the planet. Sure enough, I have seen many large enterprises whose inertia, bureaucracy, myopia, and culture left them too paralyzed to undertake anything but the most incremental innovation. Even when they tried to rejuvenate themselves through some type of “innovation initiative,” I saw more failures than successes. These cases seemed to confirm the prevailing hypothesis that large scale and innovation don’t mix. As I peered further, however, I began to realize that the root cause of such malaise and the reason so many innovation initiatives fail have more to do with management practice and leadership than with organizational scale per se. Yes, organizational size complicates innovation and can make it hard to sustain or renew innovation capabilities. But, the more I looked (and the more I compared experiences with small start-ups), the more I believed that scale *if properly exploited* could actually be an advantage, not a liability, for innovation.

The hypothesis that larger enterprises can become highly innovative started me on a decade-long journey of research, case writing, and consulting to better understand which management practices enable companies to sustain their innovative capabilities even as they grow quite large.

I also dug deeply into decades of academic literature on the drivers of

innovation performance. My research and experience along with the work of other scholars led me to conclude that company growth and size do *not* need to spell the end of an organization's innovative days. Innovative performance is rooted in a combination of *strategy, organizational systems, and culture*, all of which are shaped by leadership. *Creative Construction* explores how leaders of both growing and large established enterprises can develop strategies, design systems, and build cultures required for sustained innovation performance.

Many management books promise simple solutions to complex problems. Unfortunately, at least when it comes to innovation, I do not believe such a recipe or formula exists. Innovation is *hard*. It is not only hard to come up with a commercially successful innovation, but it is even harder to build an organization capable of creating such innovations time and again. There is no magic elixir or single best model for building a durably innovative enterprise. Different enterprises have followed different approaches. Thus, I offer no simple blueprints for instant innovation success. Instead, I wrote *Creative Construction* for thoughtful practitioners seeking well-grounded principles and frameworks that can help them find the paths that work best for *their* organizations. Innovation is and always will be a difficult journey. My hope is that this book inspires and prepares you to lead this journey.

Although I have spent my entire career as an academic at the Harvard Business School, I have also engaged heavily in the world of practice as a consultant, as a company cofounder, and as a board member of several enterprises. Having my feet in the worlds of both practice and academia has shaped how I see the problems explored in this book. I have written *Creative Construction* to bridge these two worlds. While drawing from my own and others' scholarly research on innovation (references are provided in the endnotes for the interested reader), I have tried to write in an accessible style. My hope was to create a book that has the expected *rigor* of scholarly work without its typical *mortis*.

A project like this would not have been possible without the help and support of many different organizations and individuals. I am grateful for the generous financial support provided by the Harvard Business School to pursue the research underpinning this book. Many of the examples used in the book are from case studies I wrote thanks to the funding of the Harvard Business School. These examples are acknowledged in the references.

In addition to academic research and case writing, my work has benefitted from extensive consulting experience with a broad range of companies

throughout the world and across many industries, including the pharmaceutical and life sciences industry, specialty chemicals, medical devices, manufacturing, financial services, consumer products, electronics, and telecommunications. Such experience has exposed me to the real challenges faced by practitioners operating in complex organizations. Through my consulting, I have been better able to understand how hypothesized solutions to problems actually work in practice. The feedback I received from numerous clients has been enormously valuable to me. In various parts of this book, I use examples drawn from my consulting experience. Where those examples may contain proprietary or sensitive information, I do not name the companies unless I have received explicit permission from the individuals and companies involved.

Many company examples in the book are based on publicly available information. Some of those examples include companies with which I also happened to have consulted or been associated in some capacity. In keeping with Harvard Business School's conflict of interest policies, and my own personal beliefs in transparency, the companies referenced in the book for whom I have consulted, served as a director, or have a financial interest exceeding \$10,000 include the following: Johnson & Johnson, Genentech (a wholly owned subsidiary of the Roche Group), Corning Corporation, Becton Dickinson, GlaxoSmithKline, Microsoft, Teradyne, and Flagship Pioneering (a significant investor in Axcella Health, where I serve on the board of directors).

I am deeply grateful to my colleagues at Harvard Business School, who have been enormous sources of intellectual stimulation. In particular, I want to thank my mentors, Kent Bowen, Kim Clark, Bob Hayes, and Steve Wheelwright, whose intellectual fingerprints are all over this book. My understanding of the issues explored here also benefitted immeasurably from collaboration and teaching with Amy Edmondson, Willy Shih, and Vicki Sato. I also want to thank Dean Nitin Nohria of the Harvard Business School for his friendship and support over the course of my career.

I am grateful to Andrea Kates for a number of conversations that really got me thinking seriously about the problems of innovating at scale and for her insightful comments on an early outline. I would especially like to thank Bill Kozy for his helpful comments on the proposal and for countless conversations over the years that shaped this book in profound ways.

I am indebted to Eric von Hippel of MIT, who has inspired my work since we met in the early 1980s and who generously provided detailed comments and suggestions on several chapters. I want to thank my good friend, collaborator,

and colleague Francesca Gino for her comments on specific chapters and for the many conversations we have shared about the topics covered in this book.

I am deeply indebted to John Mahaney, my editor at Hachette Book Group. From our first conversation about the book proposal, John has been incredibly supportive and is everything an author could ask for in an editor. I also want to thank my agent, Danny Stern, and his team at Stern & Associates for support and guidance on this project from the beginning.

My longtime collaborator, Sharon Pick, worked behind the scenes once again, reading and editing drafts and providing very helpful comments. This is now the third book I have written with Sharon's help, and I grow ever more grateful to her with each one. Jesse Shulman, my research assistant at Harvard Business School, did a terrific job conducting extensive and diligent background research. I am especially thankful to Sophie Bick, who did a first-rate job in preparing the manuscript for publication.

Finally, I want to sincerely thank my wife, Alice. I know full well the sacrifices you have borne for the sake of my work, particularly in the past year. You accommodated my incessant travel and my countless sudden urges to write (regardless of the chaos our two young children might be wreaking at the moment!). Your patience and endless support make me realize how lucky I am to have you by my side. This work is as much yours as it is mine.

Concord, Massachusetts
April 3, 2018

INTRODUCTION

Innovation's Catch-22

One of the many unforgettable scenes in Joseph Heller's *Catch-22* culminates in Yossarian's insight that "Orr would be crazy to fly more missions and sane if he didn't, but if he was sane he had to fly them. If he flew them he was crazy and didn't have to; but if he didn't want to he was sane and had to. Yossarian was moved very deeply by the absolute simplicity of this clause of Catch-22 and let out a respectful whistle. 'That's some catch, that Catch-22.'"

Yossarian would perhaps also be deeply moved by the paradox of innovation, one that comes with its own special catch. Innovation spawns growth, and growth by definition leads to scale, but scale seems to make the task of innovation more difficult. Even worse, the imperative to innovate keeps escalating because competition is dynamic. Rivals and new entrants eventually imitate what you have or come up with something even better. The more you succeed at innovation, the more you need to keep innovating, but the harder the task becomes. It is like those cardiac stress tests where the medical technician turns up the speed of the treadmill every time you get comfortable. You might be forgiven for thinking the technician is trying to kill you. Fortunately, the technician (usually) knows enough to stop the test before you have a heart attack. But competition does not work this way. No one is turning down the dial. In fact, competitors really do want to kill you!

Companies innovate to grow. It is hard to think of many companies in the past hundred years that achieved significant scale without being an innovator. Industrial giants of the twentieth century—DuPont, RCA, Ford, General Electric, Disney, Johnson & Johnson, McDonald's, IBM, Walmart, Kodak, Intel, Microsoft—and those of the twenty-first century—Apple, Google, Amazon, Facebook—were all innovators of either technology or business models. Innovate and you grow. This is the promise. It's why in 2017 US companies invested about \$365 billion on R&D. Globally, corporate R&D expenditures topped \$700 billion in 2017, according to the most recent estimates.¹ It's why

venture capitalists invested \$155 billion in 2017.² And why every company CEO talks about the imperative to innovate and why business school executive programs on innovation are oversubscribed. Like all promises, though, this one comes with a catch.

The idea that successful innovators sow the seeds of their own destruction was originally posed more than seventy years ago. The great Austrian economist Joseph Schumpeter described a process he termed “creative destruction” whereby existing “economic structures” (which included existing enterprises) could be destroyed by either technological innovation or organizational innovation.³ Writing in 1939, Schumpeter was particularly astute in recognizing that established successful enterprises were vulnerable to the “gales of creative destruction”:

Most new firms are founded with an idea and for a definite purpose. The life goes out of them when that idea or purpose has been fulfilled or has become obsolete or even if, without having become obsolete, it has ceased to be new. That is the fundamental reason why firms do not exist forever. Many of them are, of course, failures from the start.... [O]thers die a “natural” death, as men die of old age. And the “natural” cause, in the case of firms, is precisely their inability to keep up the pace in innovating which they themselves had been instrumental in setting in the time of their vigor.⁴

Beginning in the 1980s, a set of scholarly studies began to unearth the underlying reasons why once-successful innovators might ultimately be swept away by the winds of creative destruction.⁵ As the autopsies piled up—Xerox, RCA, Polaroid, Kodak, Wang, DEC, Nokia, RIM, Sun Microsystems, AT&T, Yahoo, and many others—a depressing picture emerged. Large established enterprises not only appeared to be incapable of leading any type of revolution; they could not even respond to attacks by new entrants. Their organizational pathologies included inertia and growing bureaucratization, loss of tolerance for risk, fears about cannibalizing existing products, ingrained processes for R&D, commitment to existing technologies and assets, religious adherence to current business models, an overreliance on flawed financial metrics, and leadership myopia. When it comes to innovation, large enterprises looked like patients suffering from multiple deadly maladies.

The thesis that large corporations cannot succeed at transformative innovation has been repeated so often by so many that—like some law of nature—it is no longer questioned. This is not just an academic issue but also one that influences management practice. Even leaders of many larger enterprises seem to have surrendered to the “fact” that they cannot grow organically through innovation but instead must buy innovation through acquisitions. Investors and analysts also believe it. They pressure larger enterprises to cut back on riskier, long-term research projects to free up cash for stock buybacks and dividends. The highly influential investment bank Morgan Stanley, for instance, issued an analyst report in January 2010 recommending that pharmaceutical companies dramatically slash internal research spending and instead focus on in-licensing development drugs from external sources.⁶ Citing the industry’s poor track record of R&D productivity, the report argued that buying innovation from the outside offered a better return on investment. The implicit assumption in this report is that larger companies are inherently less capable of innovation than are smaller biotechnology companies.

Transformative innovation inside a large enterprise is viewed as a complete waste of shareholder money. Better to return the money to shareholders, who can give it to venture capitalists to invest in start-ups. When I told a longtime venture capitalist friend of mine that I was writing a book on innovation in large enterprises, he smiled wryly and said, “At least it will be a short book. They can’t.”

Large organizations are said to lack the DNA for innovation. This genetic metaphor is powerful because for natural species (like us humans), capabilities are deeply rooted in DNA. DNA explains why a cheetah runs faster than an elephant. And, in natural species, DNA is essentially immutable for the individual. Growing up in Westwood, Massachusetts, I dreamed of playing for the Boston Celtics. Unfortunately, my DNA (or, more precisely, the DNA I inherited from my parents) endowed me with neither great height nor much athletic prowess. And, no matter how many hours I practiced in the driveway, there was nothing I could do to change my DNA. This is where the metaphor breaks down. Natural laws, like those associated with genetics, govern *natural* phenomena. Organizations, of course, are not natural phenomena; they are completely man-made, designed and run by people. “Organizational DNA” is not immutable. Unlike you or me, organizations *can* manipulate their own DNA. *Through systematically creating an innovation strategy, designing an innovation system, and building an innovation culture*, organizations develop the capability

for transformative innovation regardless of scale. If larger enterprises seem incapable of transformative innovation, it is because we design them and run them to be that way. *Creative Construction* examines how we can design and run them differently in order to better succeed at innovation.

Small Is Beautiful Does Not Mean Big Is Ugly

There is no doubt that entrepreneurial firms are a potent source of transformative innovation. Entrepreneurial firms have revolutionized countless industries, from software and semiconductors to beer and biotechnology. Whenever you see an industry transformed, you usually do not have to look far to see an Intel, an Apple, a Microsoft, a Genentech, a Netscape, an Amazon, a Google, a Netflix, or an Uber. Yes, many (many!) start-ups die. We only get to celebrate the few big winners, but as an organizational species, entrepreneurial firms are spectacularly successful innovators. When it comes to innovation, small *can be* beautiful.

Does this mean, though, that big must therefore be ugly when it comes to innovation? I spend a lot of time in both entrepreneurial firms and very big companies as researcher and advisor. And, at first glance, the answer would seem to be yes. Instead of the creative focus, energy, and youthful enthusiasm of the start-up, I too often find endless hours of meetings, labyrinths of procedures and policies, and decision making mangled by byzantine organizational matrices. Whereas the start-up wants to be a Formula 1 race car (fast, agile, not very reliable, and sometimes pretty dangerous), the large enterprise emulates a freight train—predictable, boring, and rigid.

You may have made the same observation or even experienced the difference directly by moving from a big corporation to a start-up or working in a start-up acquired by a big corporation. You might have worked in a successful start-up that, thanks to its success, became relatively large. I have come across many instances where the transition from Formula 1 race car to freight train happened relatively fast in the life of a company. One day, it was a nimble, hungry start-up aspiring to revolutionize an industry; a few years later, after it had \$1 billion in annual revenue, it was a freight train barreling down a single track. But this observation raises a few questions. Is this state of organizational affairs inevitable? Are the innovation-stifling characteristics we commonly see in a larger organization inherent to its large scale, or are they simply the artifacts of conscious or unconscious design choices made by its leaders? Are successful young companies really doomed to become lumbering freight trains if they are

fortunate enough to grow? *Must big be ugly when it comes to innovation?*

Despite our perception about smallness and beauty and bigness and ugliness, it may be surprising that statistical evidence relating company size and innovation paints a far more nuanced picture.⁷ Big does not always mean ugly. Scale alone is not an impediment to innovative capacity. My own work on this topic compared the R&D productivity of large pharmaceutical companies to that of biotechnology companies from 1984 to 2004.⁸ At the time I performed the study, the conventional wisdom in the industry was that large pharmaceutical companies were less productive at R&D than smaller biotechnology companies (the same logic underpinning the Morgan Stanley analyst report). But my study—which traced the origin of every drug approved over a twenty-year period by the largest twenty pharmaceutical companies and more than 250 biotechnology companies—showed a “statistical dead heat” between the R&D productivity of both types of companies. So much for the hypothesis that big is ugly.

But what about transformational innovation—the type that ushers in waves of creative destruction and leads to upheavals of entire industries? The evidence here is a bit clearer but still not completely without important wrinkles. In general, innovations that disrupt specific industries *tend* to originate from new entrants.⁹ I stress “tend” because there are important exceptions. Consider, for instance, that Intel revolutionized the semiconductor industry by inventing and commercializing the microprocessor. Intel, however, was already a semiconductor company; it was not a new entrant into the semiconductor industry when it invented and commercialized the microprocessor. Second, I stress “entrants” because there is a big difference between a new firm (a start-up) and a new entrant. Established firms can be new entrants if they diversify from one industry to another. Waves of creative destruction can originate from firms of any size. Large size does not prevent companies from being transformative innovators.

Let’s consider some historical and more recent examples. In April 1964, IBM introduced the 360 line of mainframe computers.¹⁰ Prior to that time, every new machine required the development of a unique new operating system and hardware. There was little if any interchangeability between machines, even those made by the same company. This was becoming incredibly costly because everything had to be developed from scratch. It also made maintenance and support a major headache. IBM revolutionized computer architecture by creating common underlying software, like the operating system, and hardware that could be used across multiple machines. Today, we take this concept of modularity and

interoperability for granted. In 1964, it was unheard of, and it completely revolutionized the computer industry. It triggered an explosion in demand for mainframes, and it created new markets for peripherals and software development. In 1964, IBM was neither a start-up nor a new entrant into the computer industry. It was already the largest computer company in the world and ranked number 18 on the Fortune 500 that year (its sales of \$2 billion would be equivalent to approximately \$15.5 billion today after adjusting for inflation).¹¹ This is a great example of a large, dominant incumbent in an industry disrupting the very industry in which it competed. Most theories of innovation say this is not supposed to happen. But it did.

Let's take another example. In 1982, a team of scientists modified the genetics of a plant cell, an invention that laid the foundation for today's genetically modified crops. Despite the controversy, it is hard to dispute the economic significance of this innovation. GMOs account for the vast majority of soybeans, corn, and cotton produced in the United States and transformed the agricultural seed industry. But this invention did not come from a start-up. It came from a team of scientists working at then-eighty-one-year-old Monsanto Corporation, a behemoth agricultural chemicals company (ranked number 50 on the Fortune 500 in 1982, with sales of \$6.9 billion, the equivalent of \$17.1 billion today). At the time, Monsanto was not even in the seed business, but today it is the world's largest seed company. This is an example of a large player from one industry transforming itself and another industry through innovation.

There are many other historical examples of large companies succeeding at transformative innovation. Think about 150-year-old Corning, which invented fiber-optic cable and the glass manufacturing processes critical to today's computer, television, and phone displays. And, of course, Bell Labs almost single-handedly drove the transformation of the twentieth century with a series of inventions such as the transistor, the microwave, cellular communications, the laser, satellite communications, digital transmission and switching, solar cells, and the Unix operating system (among many others). Bell's massive size did not seem to impede its capacity for innovation.

Well, then, you may think, "History is fine, but times have changed. The day of the big lab is dead. We live in the age of entrepreneurs." So, let's move closer to the present: Apple. Everyone knows the story of how the iPhone completely redefined the market from mobile phones to mobile communications. It was both a classic Schumpeterian gale—destroying once-mighty incumbents like Nokia, Motorola, and RIM—and a brilliant act of creative construction. In 2007, the

year Apple launched the iPhone, the company was no spring chicken: it was thirty years old. And it was no minnow either. Its sales of \$24.6 billion put it at number 123 on the Fortune 500.¹²

Amazon is another contemporary example of a huge company invading other industries. There are really two Amazon stories. The first is the classic start-up. This was the story of how Amazon.com brought us into the world of online shopping, at the expense of just about every brick-and-mortar retailer. The second story, though, is one of a still-young but relatively large company, which has continued to succeed at transformational innovation. In 2004, Amazon introduced one of the first cloud-based computing services and launched the cloud computing revolution. This represented a major business model innovation for Amazon, as selling web services is completely different from being an online retail business. Amazon's revenues that year were \$5.2 billion, and the company ranked number 342 on the Fortune 500.¹³ Amazon might have been young, but it was *not* small by any standard. Today, Amazon is a \$178 billion company, and it continues to innovate and experiment with new businesses such as video streaming, content production, drone delivery, groceries, and health care.¹⁴

Today, we see a number of large companies actively engaged in potentially transformative innovation. Alphabet (formerly known as Google) is a \$90 billion enterprise (ranked number 27 on the Fortune 500).¹⁵ It dominates Internet advertising, of course, but it has also been a pioneer in autonomous vehicles. Honda, a giant auto company, is attempting to transform the corporate jet market by developing a low-cost, lightweight jet that can efficiently serve as an “air taxi.” It is too early to say whether these businesses will succeed, but they are certainly trying. If large enterprises are not supposed to pursue transformative innovation, it looks like these folks never got the memo.

These examples—and probably many more you can think of—provide something akin to an “existence proof” that scale alone is *not* a showstopper when it comes to transformative innovation. But just because something is possible does not mean it is easy, either. It's not. Innovating at scale takes work—work that is dependent upon thoughtful strategies and significant efforts that are distinct from those that tend to succeed in small enterprises.

The Challenge of Creative Construction

Building an innovative venture from scratch is hard. Many of you can personally attest to the brutally long hours, the harrowing moments when cash is short, and

the stress of knowing that just one bad move can spell disaster for the whole enterprise. We celebrate entrepreneurs for good reasons. And yet, as tough as it is to build an innovative company from the ground up, the task of sustaining and rejuvenating an existing organization's innovative capacities—what I call “creative construction”—is even tougher. Whereas entrepreneurship is like building a new house from the ground up (albeit on a tight budget), creative construction is akin to renovating a home while living in it. It takes real creativity to build something new out of something old. Creative construction takes leaders who constantly renew and rebuild their organizations' innovative capabilities. They don't buy the rhetoric that success—and the scale that it produces—must ultimately breed stasis. They don't see their organizations, no matter how large, as immutable blocks of stone. They are not content to decline gracefully and to die, as Schumpeter said it, as “old men die of old age.”

Creative construction requires a delicate balance of exploiting existing resources and capabilities without becoming imprisoned by them. Johnson & Johnson (J&J) provides insight into why creative construction is so difficult, illustrating the extreme end of both the challenge and the opportunity created by scale. J&J is the world's largest health-care company, with revenues of approximately \$75 billion.¹⁶ It is, as of this writing, in the top 100 companies in the world by revenues and in the top 15 by market capitalization.¹⁷ It operates in more than sixty countries around the globe and employs 134,000 people.¹⁸ It spends \$10.5 billion in R&D—through more than a dozen different R&D laboratories located throughout the United States, Europe, and Asia and also through more than one hundred external partnerships.¹⁹ The company competes across three major health-care sectors—pharmaceuticals, medical devices, and consumer health products—and operates more than 260 subsidiaries.²⁰ It sells several thousand brands, and every year it launches more than a hundred new products.

For J&J to maintain its historical rate of top line growth, it must generate about \$3 billion–\$4 billion of *new* revenue per year. If you consider that some portion of the company's existing revenue base becomes obsolete or declines every year, the net incremental growth target becomes even higher. Over the next ten years, J&J needs to generate about \$35 billion in net new revenue. To put this challenge in perspective, there are fewer than 5,000 companies in the whole world today with revenues greater than \$1 billion per year.²¹ This means that J&J cannot just launch an innovation here and there and expect to grow. It has to generate a continuous stream of innovations over time.

This challenge is tough enough, but it gets worse. (I feel like the medical technician turning up the dial on the treadmill.) J&J does not get to start with a blank slate. It has existing businesses, which generate all its revenue and profits, to support and defend. It cannot take its eye off them while pursuing new opportunities. Although it has a massive reservoir of resources and capabilities, many are honed to the requirements of those existing businesses and may not be suited to the new opportunities it wants to explore. Building new capabilities takes time and investment that must come from the existing businesses generating all the profits.

The challenge gets even tougher when you consider the sheer complexity of an organization like J&J. Complexity is a much bigger problem for innovation than scale alone. Complexity is a function of the number of moving parts—such as different business units, different functions, different geographies, different processes, different technologies, and different people—that must be synchronized. And when you get to be the scale of a J&J, you have *a lot* of moving parts. Complexity makes innovation more difficult because innovation, *by definition*, involves change. In a complex organization, innovation in one part might require carefully synchronized changes across different business units, functions, and geographic markets. Add the common reality that not everyone in the organization may see the benefits of an innovation so positively, and you now have a system with serious frictions. Friction impedes mobility. Lack of mobility means lack of innovation.

An example like J&J also highlights, though, the potential benefits of scale for innovation. Larger enterprises like J&J have massive financial resources to explore new opportunities. They can hedge highly risky technology bets through parallel experimentation in ways that start-ups can only dream of. They can build vast networks of external collaborators to explore a broad array of emerging technologies. They have incredibly deep reservoirs of technical talent and operational skills critical to bringing innovations to market. They have global distribution and a strong brand. They have the infrastructure, know-how, and processes to get an innovative new product into the hands of *millions* of customers around the world almost instantly. They have decades of experience working with regulatory and government authorities. You cannot underestimate how critical such complementary capabilities are to successful innovation. Many start-ups with spectacularly great technologies have failed because they lacked these capabilities.

The example of J&J could be applied to countless other large enterprises that

face the dilemma of scale that simultaneously is an incredible strength and an incredible liability with respect to innovation. Jeff Bezos, in his 2015 letter to Amazon shareholders, captures this dilemma succinctly: “Used well, our scale enables us to build services for our customers that we could otherwise never have even contemplated. But also, if we are not vigilant and thoughtful, size could slow us down and diminish our inventiveness.”²²

You do not have to be the size of J&J or Amazon to come face-to-face with this dilemma. The challenge of scale creeps into organizations relatively early in their life cycle. Young companies that have successfully launched their first major products and are growing rapidly face many of these same dilemmas: How much to invest in the existing product versus potentially new platforms? How do we leverage our existing capabilities without letting them hamstring us? How do we preserve our Formula 1 culture as we become a larger, more complex organization? The challenge of innovating at scale is to leverage these real strengths while figuring out ways to circumvent or eliminate the potential weaknesses.

Why Most Innovation Initiatives Fail

If you have worked at a large company, you may have lived through something called an “innovation initiative,” a major organizational change effort aimed at creating or rejuvenating an organization’s innovative capacities. These initiatives take many different forms, but they usually involve some combination of structural, process, and cultural change. They’re a typical response when a company’s growth has slowed and the CEO or another senior leader decides that innovation is the key to fixing this problem.

If you have lived through one of these rejuvenation campaigns, you can attest to the hurdles involved. Becoming a reborn innovator is *not* like riding a bicycle. Once the innovation muscle has atrophied, it’s not a matter of just a bit of “exercise” to get back in form. You have to rebuild those capabilities from the ground up. You have to create entirely new organizational systems and build a new culture. There is a lot to figure out. How do you find new ideas? How do you stimulate creative thinking? How do you figure out which ideas to pursue and drop? How do you motivate people? How do you get people comfortable with all the uncertainties associated with innovation? This is tough stuff. But now consider that you have to do all this within an existing enterprise with existing systems and processes, current structures, and a deeply ingrained

culture. Like any major organizational change effort, innovation initiatives are not necessarily going to garner universal support. Conflicts are inevitable. And now remember that you are going to undertake this massive organizational transformation, all the while keeping your *existing* businesses competitive and your finances healthy.

Throughout my career, I have had a chance to observe many such initiatives unfold. They follow an all too familiar pattern. They are launched with great fanfare and enthusiasm. Senior leadership gives encouraging speeches about how important innovation is to the future of the company. Company communications are laced with talk about innovation. Promises are made about big changes to come. The culture will be more tolerant of failure, less hierarchical, and more open to out of the box thinking. Everyone will be encouraged to contribute innovative ideas. Teams of managers tour exemplar innovators (at least those who are willing to let them visit) and come back intoxicated with ideas about how to make the company more “Silicon Valley-like.” Structures—like innovation groups or chief innovation officers—are installed to drive the effort. Optimism reigns. But, after a year or two, things begin to bog down. People start noticing that not much has changed. There are few, if any, new innovative programs under way. The few that do get proposed have a hard time gaining traction. There have also been some costly failures. The CFO is asking about the return on investment. Business unit leaders begin to complain that they are being starved of critical resources needed to upgrade product lines and to fend off intensifying competition. Budgets are tight and tough calls have to be made. The company is feeling earnings pressures, and the once-supportive board is concerned about the lack of progress to date. Senior management is feeling the pressure to deliver an innovation win. Throughout the organization, many of the old behaviors are still alive and well. There is little appetite for risk, and the perception that senior management does not *really* tolerate failures is pervasive. There are complaints that the company’s bureaucracy is stifling innovation. Communications about innovation come fewer and further between. Senior leaders who happily associated themselves with the innovation initiative now look nervously for other assignments. As time passes, managers further down the ranks adopt a “this too shall pass” attitude.

Why do so many innovation initiatives follow such a depressing path? Why do so many fail? We first have to acknowledge that any major organizational change—whether focused on innovation, quality, customer service, or something else—is extremely difficult. By some estimates, about 70 percent of

organizational change efforts fail.²³ The usual reasons for such failures, such as lack of senior management commitment, middle management resistance, and inability to execute, certainly play their part in stifling innovation initiatives. However, the problems go much deeper. In fact, I have observed a number of cases in my career where senior leadership *was* deeply committed to innovation, where the middle managers *were* enthusiastic about the change, and where extensive attention *was* devoted to execution, and, despite all this, the effort still failed.

Why? Because building a capacity to innovate involves overcoming several specific obstacles. The first is the required time horizon. Building innovation capabilities is a multiyear voyage. It cannot be *this year's* goal. Even once the capabilities are built, it takes *at least* one product development cycle to see any impact from your efforts. Depending on the industry, this can range from a couple of years to more than a decade. This is a long time to sustain the requisite management focus and energy. This is particularly true given that you can expect some degree of management turnover during this period.

A second vexing problem is that inherent trade-offs are demanded by innovation. Any company with existing lines of profitable businesses faces a fundamental strategic dilemma: How much should it invest in existing businesses and existing capabilities versus new (uncertain) businesses and capabilities? How much should it invest in incrementally improving existing products and services versus exploring new technology spaces and new business models? Every dollar that goes into exploring a new space means one less dollar for making an important refinement to an existing product. Too often in the writing on innovation, there is a bias that companies should always be investing in the new wave of “disruptive” innovation, and that investments in existing businesses are myopic at best and suicidal at worst. Such thinking grossly oversimplifies the problem. There is often no simple “right” answer to these choices, just complex trade-offs.

Trade-offs are also inherent in choices made about innovation management practices, and a failure to come to grips with such trade-offs is another reason innovative initiatives fail. Too often, innovation initiatives become a grab bag of widely touted “best practices” such as open innovation, design thinking, rapid prototyping, autonomous decentralized teams, and internal venturing. There is nothing wrong with any of these practices per se, but as I discuss throughout this book, there are no universally “best” innovation practices. *Every* innovation practice has its strengths *and* weaknesses. There are no magic bullets. As a

result, building a capacity to innovate requires making some very difficult organizational and process design choices.

Finally, building innovation capabilities involves profound cultural changes. Just about every behavioral norm that enables a company to succeed with existing products and services—reliability, predictability, disciplined execution of well-defined plans—runs counter to the behaviors required to foster innovation—risk taking, creative exploration, rapid learning and experimentation, comfort with ambiguity, and so on. Going back to the great organizational theorist James March, organizations that tend to be good at “exploiting” existing business tend to struggle with “exploring” new terrain.²⁴ This is partly due to organizational systems and processes, but more important are the cultural differences between what is required to explore versus what is required to exploit. It’s not as easy as saying “banish” the old culture, because that culture is critical to driving performance in the existing businesses (which are, after all, paying the bills). A new culture more oriented toward innovation has to be created while also preserving the culture that supports the existing businesses. Innovation initiatives have to confront this conflict.²⁵

The Challenge Is the Opportunity

At this point you might be wondering, Why on earth take on such a challenge? Why should I as a leader take on such a risky organizational transformation? (And, by analogy, why should I continue reading the rest of the book?) The odds surely seem heavily stacked against me. Maybe I should heed the advice of so many others to give up on the idea of building an innovative capacity inside a large organization and instead buy up small companies that are good at innovation. This must be easier, faster, and certainly less risky.

But here’s the problem with that strategy: If innovation were easy, everyone could do it, and then innovation could no longer be a source of advantage. Competitive advantage rests on possessing *unique* and *difficult to imitate* skills and capabilities. Apple has done well because there are not many Apples out there. The capability to innovate is a potent source of competitive advantage precisely because it is such a difficult one to foster and sustain.

And this is why acquisitions are no shortcut to innovation nirvana. If you can buy something, so can your competitors. The market for corporate assets is pretty efficient. This means that, on average, you get what you pay for. If a great innovative company that everyone wants to buy is on the market, you are going

to pay handsomely for that privilege. In many cases, all you end up doing is transferring some of your shareholders' wealth to the acquired firm's shareholders. There is generally no net gain in shareholder wealth created, and, in fact, large acquisitions tend to destroy value for the acquiring firm.²⁶ Everyone thinks they can "beat the average" because they believe they are smarter than the average. You do not have to have been a math major to see the fallacy of this logic.

Furthermore, if you acquire an innovative firm (for which you have paid dearly), you will still face the task of trying to keep it an innovative organization. The problem is that enterprises that are not especially innovative have a terrible time managing innovative organizations (almost by definition!). All those obstacles we described above—like competing priorities with existing businesses and different cultures—do not go away just because you acquire an innovative company. Suddenly, that company (now a subsidiary) has to flourish inside an enterprise whose systems and culture are not geared toward innovation. This leads to the common outcome where the acquisition itself destroys the acquired firm's unique innovative capabilities and culture. It does not happen all the time. Some firms are able to protect their new acquisitions from the processes, culture, and strategies that have been suppressing innovation all along. But it's rare. It is much more common for the acquirer to "kill the goose that lays the golden eggs." This does not mean acquisitions cannot be part of your tool kit of innovation tactics. Selective M&A can be extremely valuable, especially if there are unique complementarities between your capabilities and the target firm. We will discuss them later in the book. But M&A alone cannot be your innovation strategy.

Throughout this book, I offer no illusions about how difficult it is to innovate at scale. There are many forces that make it hard to build and maintain a capability to innovate. The journey is fraught with many traps. As a leader, you have to be great at strategy, execution, and culture. You will encounter resistance along the way. I am hoping the frameworks, tools, principles, and examples I provide will make the journey easier for you and your organization. But the journey is not easy. Even with the best equipment, the best guides, the best training, and the best strategy, summiting Mount Everest is no cakewalk. But, imagine trying to take on Everest without these resources! Innovation is a capability that must be built, not bought. It is incredibly hard and very risky. But it creates real value and sustainable advantage, leveraging the strengths of a large company in a way that no small start-up can match. That's exactly why

you should be trying to do it. My hope is that this book provides you with motivation and the tools to make this difficult task *easier* for you to accomplish. Building an organization's capacity to innovate involves three essential leadership tasks: (1) creating an innovation strategy, (2) designing an innovation system, and (3) building an innovation culture. It is around these three tasks that *Creative Construction* is organized.

PART I

CREATING AN INNOVATION STRATEGY

An innovation strategy specifies how the company intends to use innovation to create and capture value and clarifies priorities among different types of innovation opportunities. A good innovation strategy serves two critical purposes. First, it helps clarify the trade-offs the company is willing to make between short-term exploitation of existing markets and longer-term exploration of new opportunities.¹ Such clarity is critical because, without it, the temptation in most organizations is to focus on exploitation. It always *seems* more profitable to invest in improving the existing product line than to search for something completely new. In clarifying these trade-offs, a clear innovation strategy sets the stage for effective execution. Second, a good innovation strategy helps to align diverse parts of an organization around common priorities. Such alignment is particularly critical in complex organizations with many moving parts. By driving alignment, a good innovation strategy makes a large organization a less complex place for innovation.

Part I of this book provides frameworks and principles needed to create an effective innovation strategy. It examines the different types of innovations a company might pursue, the trade-offs among them, and how different types of innovation (including business model innovation) can be used as part of a company's overall innovation strategy. Part I also provides insights about how to respond to potentially transformative new technologies that may actually *threaten* your business.

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BEGINNING THE JOURNEY

The Discipline and Focus of an Innovation Strategy

In Lewis Carroll's *Alice's Adventures in Wonderland*, a lost Alice runs into the Cheshire Cat and asks him, "Where should I go?" The grinning Cheshire Cat responds, "That depends on where you want to end up." We do not normally think of children's books written in the mid-nineteenth century as teaching strategy theory, but in essence the Cheshire Cat was invoking the first principle of strategy: strategy starts with clear understanding of objectives. Many organizations start their innovation journeys much like Alice. They lack a clear sense of their innovation objectives. They do not know where they want to go on their innovation journey. Others have clear objectives but do not put in place the strategy to achieve them. Imagine you were going to take a long and difficult trek through the wilderness to reach the summit of a mountain (your goal is clear). The terrain will shift constantly. Huge rocks, fallen timber, and other obstacles will litter the trails. The trails will not be well marked and will often fork unexpectedly. And your expedition consists of a big group of people, not all of whom share your enthusiasm for the wilderness. You would not even think about setting out on such a journey without a reasonable plan, a good map, and a compass. And yet this is essentially what many leaders do when they try to tackle innovation.

Getting Lost on the Innovation Journey

Earlier in my career, I consulted for a company who had once been a leader in the contact lens market. The company's competitive position was being destroyed by a competitor (a J&J subsidiary, it turns out) that had introduced the world's first disposable contact lens. Because they were thrown away every