

CHAPTER ONE

THE GROWTH IMPERATIVE

Financial markets relentlessly pressure executives to grow and keep growing faster and faster. Is it possible to succeed with this mandate? Don't the innovations that can satisfy investors' demands for growth require taking risks that are unacceptable to those same investors? Is there a way out of this dilemma?

This is a book about how to create new growth in business. Growth is important because companies create shareholder value through profitable growth. Yet there is powerful evidence that once a company's core business has matured, the pursuit of new platforms for growth entails daunting risk. Roughly one company in ten is able to sustain the kind of growth that translates into an above-average increase in shareholder returns over more than a few years.¹ Too often the very attempt to grow causes the entire corporation to crash. Consequently, most executives are in a no-win situation: equity markets demand that they grow, but it's hard to know *how* to grow. Pursuing growth the wrong way can be worse than no growth at all.

Consider AT&T. In the wake of the government-mandated divestiture of its local telephony services in 1984, AT&T became primarily a long-distance telecommunications services provider. The break-up agreement freed the company to invest in new businesses, so management almost immediately began seeking avenues for growth and the shareholder value that growth creates.

The first such attempt arose from a widely shared view that computer systems and telephone networks were going to converge. AT&T first tried to build its own computer division in order to position itself at that intersection, but was able to do no better than annual losses of \$200 million. Rather than retreat from a business that had proved to be

unassailable from the outside, the company decided in 1991 to bet bigger still, acquiring NCR, at the time the world's fifth-largest computer maker, for \$7.4 billion. That proved only to be a down payment: AT&T lost another \$2 billion trying to make the acquisition work. AT&T finally abandoned this growth vision in 1996, selling NCR for \$3.4 billion, about a third of what it had invested in the opportunity.

But the company *had* to grow. So even as the NCR acquisition was failing, AT&T was seeking growth opportunities in technologies closer to its core. In light of the success of the wireless services that several of its spun-off local telephone companies had achieved, in 1994 the company bought McCaw Cellular, at the time the largest national wireless carrier in the United States, for \$11.6 billion, eventually spending \$15 billion in total on its own wireless business. When Wall Street analysts subsequently complained that they were unable to properly value the combined higher-growth wireless business within the lower-growth wireline company, AT&T decided to create a separately traded stock for the wireless business in 2000. This valued the business at \$10.6 billion, about two-thirds of the investment AT&T had made in the venture.

But that move left the AT&T wireline stock right where it had started, and the company *had* to grow. So in 1998 it embarked upon a strategy to enter and reinvent the local telephony business with broadband technology. Acquiring TCI and MediaOne for a combined price of \$112 billion made AT&T Broadband the largest cable operator in the United States. Then, more quickly than anyone could have foreseen, the difficulties in implementation and integration proved insurmountable. In 2000, AT&T agreed to sell its cable assets to Comcast for \$72 billion.²

In the space of a little over ten years, AT&T had wasted about \$50 billion and destroyed even more in shareholder value—all in the hope of *creating* shareholder value through growth.

The bad news is that AT&T is not a special case. Consider Cabot Corporation, the world's major producer of carbon black, a compound that imparts to products such as tires many of their most important properties. This business has long been very strong, but the core markets haven't grown rapidly. To create the growth that builds shareholder value, Cabot's executives in the early 1980s launched several aggressive growth initiatives in advanced materials, acquiring a set of promising specialty metals and

high-tech ceramics businesses. These constituted operating platforms into which the company would infuse new process and materials technology that was emerging from its own research laboratories and work it had sponsored at MIT.

Wall Street greeted these investments to accelerate Cabot's growth trajectory with enthusiasm and drove the company's share price to triple the level at which it had languished prior to these initiatives. But as the losses created by Cabot's investments in these businesses began to drag the entire corporation's earnings down, Wall Street hammered the stock. While the overall market appreciated at a robust rate between 1988 and 1991, Cabot's shares dropped by more than half. In the early 1990s, feeling pressure to boost earnings, Cabot's board brought in new management whose mandate was to shut down the new businesses and refocus on the core. As Cabot's profitability rebounded, Wall Street enthusiastically doubled the company's share price. The problem, of course, was that this turnaround left the new management team no better off than their predecessors: desperately seeking growth opportunities for mature businesses with limited prospects.³

We could cite many cases of companies' similar attempts to create new-growth platforms after the core business had matured. They follow an all-too-similar pattern. When the core business approaches maturity and investors demand new growth, executives develop seemingly sensible strategies to generate it. Although they invest aggressively, their plans fail to create the needed growth fast enough; investors hammer the stock; management is sacked; and Wall Street rewards the new executive team for simply restoring the *status quo ante*: a profitable but low-growth core business.⁴

Even expanding firms face a variant of the growth imperative. No matter how fast the growth treadmill is going, it is not fast enough. The reason: Investors have a pesky tendency to discount into the *present* value of a company's stock price whatever rate of growth they *foresee* the company achieving. Thus, even if a company's core business is growing vigorously, the only way its managers can deliver a rate of return to shareholders in the future that exceeds the risk-adjusted market average is to grow *faster* than shareholders expect. Changes in stock prices are driven not by simply the *direction* of growth, but largely by *unexpected* changes in the *rate of*

change in a company's earnings and cash flows. Hence, one company that is projected to grow at 5 percent and in fact keeps growing at 5 percent and another company that is projected to grow at 25 percent and delivers 25 percent growth will both produce for future investors a market-average risk-adjusted rate of return in the future.⁵ A company must deliver the rate of growth that the market is projecting just to keep its stock price from falling. It must *exceed* the consensus forecast rate of growth in order to boost its share price. This is a heavy, omnipresent burden on every executive who is sensitive to enhancing shareholder value.⁶

It's actually even harder than this. That canny horde of investors not only discounts the expected rate of growth of a company's *existing* businesses into the present value of its stock price, but also discounts the growth from new, yet-to-be-established lines of business that they expect the management team to be able to create in the future. The magnitude of the market's bet on growth from unknown sources is, in general, based on the company's track record. If the market has been impressed with a company's historical ability to leverage its strengths to generate new lines of business, then the component of its stock price based on growth from unknown sources will be large. If a company's past efforts to create new-growth businesses have not borne fruit, then its market valuation will be dominated by the projected cash flow from known, established businesses.

[Table 1-1](#) presents one consulting firm's analysis of the share prices of a select number of *Fortune* 500 companies, showing the proportion of each firm's share price on August 21, 2002, that was attributable to cash generated by existing assets, versus cash that investors expected to be generated by new investments.⁷ Of this sample, the company that was on the hook at that time to generate the largest percentage of its total growth from future investments was Dell Computer. Only 22 percent of its share price of \$28.05 was justified by cash thrown off by the company's present assets, whereas 78 percent of Dell's valuation reflected investors' confidence that the company would be able to invest in new assets that would generate whopping amounts of cash. Sixty-six percent of Johnson & Johnson's market valuation and 37 percent of Home Depot's valuation were grounded in expectations of growth from yet-to-be-made investments. These companies were on the hook for *big* numbers. On the other hand, only 5 percent of General Motors's stock price on that date was predicated

on future investments. Although that's a chilling reflection of the track record of GM's former management in creating new-growth businesses, it means that if the present management team does a better job, the company's share price could respond handsomely.

Probably the most daunting challenge in delivering growth is that if you fail once to deliver it, the odds that you ever will be able to deliver in the future are very low. This is the conclusion of a remarkable study, *Stall Points*, that the Corporate Strategy Board published in 1998.⁸ It examined the 172 companies that had spent time on *Fortune's* list of the 50 largest companies between 1955 and 1995. Only 5 percent of these companies were able to sustain a real, inflation-adjusted growth rate of more than 6 percent across their entire tenure in this group. The other 95 percent reached a point at which their growth simply stalled, to rates at or below the rate of growth of the gross national product (GNP). Stalling is understandable, given our expectations that all growth markets become saturated and mature. What is scary is that of all these companies whose growth had stalled, only 4 percent were able to successfully reignite their growth even to a rate of 1 percent above GNP growth. Once growth had stalled, in other words, it proved nearly impossible to restart it.

The equity markets brutally punished those companies that allowed their growth to stall. Twenty-eight percent of them lost more than 75 percent of their market capitalization. Forty-one percent of the companies saw their market value drop by between 50 and 75 percent when they stalled, and 26 percent of the firms lost between 25 and 50 percent of their value. The remaining 5 percent lost less than 25 percent of their market capitalization. This, of course, increased pressure on management to regenerate growth, and to do so quickly—which made it all the more difficult to succeed. Managers cannot escape the mandate to grow.⁹ Yet the odds of success, if history is any guide, are frighteningly low.

TABLE 1-1

Portion of selected firms' market value that was based on expected returns from new investments on August 21, 2002

<i>Fortune</i> 500 rank	Company name	Share price	Percent of valuation that was based on:	
			New investments	Existing assets
53	Dell Computer	\$28.05	78%	22%
47	Johnson & Johnson	\$56.20	66%	34%
35	Procter & Gamble	\$90.76	62%	38%
6	General Electric	\$32.80	60%	40%
77	Lockheed Martin	\$62.16	59%	41%
1	Wal-Mart Stores	\$53.88	50%	50%
65	Intel	\$19.15	49%	51%
49	Pfizer	\$34.92	48%	52%
9	IBM	\$81.93	46%	54%
24	Merck	\$53.80	44%	56%
92	Cisco Systems	\$15.00	42%	58%
18	Home Depot	\$33.86	37%	63%
16	Boeing	\$28.36	30%	70%
11	Verizon	\$31.80	21%	79%
22	Kroger	\$22.20	13%	87%
32	Sears Roebuck	\$36.94	8%	92%
37	AOL Time Warner	\$35.00	8%	92%
3	General Motors	\$49.40	5%	95%
81	Phillips Petroleum	\$35.00	3%	97%

Source: CSFB/HOLT; Deloitte Consulting analysis.

Is Innovation a Black Box?

Why is achieving and sustaining growth so hard? One popular answer is to blame managers for failing to generate new growth—implying that more capable and prescient people could have succeeded. The solve-the-problem-by-finding-a-better-manager approach might have credence if failures to restart growth were isolated events. Study after study, however, concludes that about 90 percent of all publicly traded companies have proved themselves unable to sustain for more than a few years a growth trajectory that creates above-average shareholder returns.¹⁰ Unless we believe that the pool of management talent in established firms is like some perverse Lake Wobegon, where 90 percent of managers are below average, there has to be a more fundamental explanation for why the vast majority of good managers has not been able to crack the problem of sustaining growth.

A second common explanation for once-thriving companies' inability to sustain growth is that their managers become risk averse. But the facts refute this explanation, too. Corporate executives often bet the future of billion-dollar enterprises on an innovation. IBM bet its farm on the System 360 mainframe computer, and won. DuPont spent \$400 million on a plant to make Kevlar tire cord, and lost. Corning put billions on the line to build its optical fiber business, and won big. More recently it sold off many of its other businesses in order to invest more in optical telecommunications, and has been bludgeoned. *Many* of the executives who have been unable to create sustained corporate growth have evidenced a strong stomach for risk.

There is a third, widely accepted explanation for why growth seems so hard to achieve repeatedly and well, which we also believe does not hold water: Creating new-growth businesses is simply unpredictable. Many believe that the odds of success are just that—odds—and that they are low. Many of the most insightful management thinkers have accepted the assumption that creating growth is risky and unpredictable, and have therefore used their talents to help executives manage this unpredictability. Recommendations about letting a thousand flowers bloom, bringing Silicon Valley inside, failing fast, and accelerating selection pressures are all ways to deal with the allegedly irreducible unpredictability of successful

innovation.¹¹ The structure of the venture capital industry is in fact a testament to the pervasive belief that we cannot predict which new-growth businesses will succeed. The industry maxim says that for every ten investments—all made in the belief they would succeed—two will fail outright, six will survive as the walking wounded, and two will hit the home runs on which the success of the entire portfolio turns. Because of this belief that the process of business creation is unfathomable, few have sought to pry open the black box to study the *process* by which new-growth businesses are created.

We do not accept that most companies' growth stalls because the odds of success for the next growth business they launch are impossibly low. The historical results may indeed seem random, but we believe it is because the process for creating new-growth businesses has not yet been well understood. In this book we intend to pry open the black box and study the processes that lead to success or failure in new-growth businesses.

To illustrate why it is important to understand the processes that create those results, consider these strings of numbers:

1, 2, 3, 4, 5, 6
75, 28, 41, 26, 38, 64

Which of these would you say is random, and which is predictable? The first string looks predictable: The next two numbers should be 7 and 8. But what if we told you that it was actually the winning numbers for a lottery, drawn from a drum of tumbling balls, whereas the second is the sequence of state and county roads one would follow on a scenic tour of the northern rim of Michigan's Upper Peninsula on the way from Sault Ste. Marie, Ontario, to Saxon, Wisconsin? Given the route implied by the first six roads, you can reliably predict the next two numbers—2 and 122—from a map. The lesson: You cannot say, just by looking at the result of the process, whether the process that created those results is capable of generating predictable output. You must understand the process itself.

The Forces That Shape Innovation

What can make the process of innovation more predictable? It does *not* entail learning to predict what *individuals* might do. Rather, it comes from understanding the *forces* that act upon the individuals involved in building businesses—forces that powerfully influence what managers choose and cannot choose to do.

Rarely does an idea for a new-growth business emerge fully formed from an innovative employee's head. No matter how well articulated a concept or insight might be, it must be shaped and modified, often significantly, as it gets fleshed out into a business plan that can win funding from the corporation. Along the way, it encounters a number of highly predictable forces. Managers as individuals might indeed be idiosyncratic and unpredictable, but they all face forces that are similar in their mechanism of action, their timing, and their impact on the character of the product and business plan that the company ultimately attempts to implement.¹² Understanding and managing these forces can make innovation more predictable.

The action and impact of these forces in shaping ideas into business plans is illustrated in a case study of the Big Idea Group (BIG), a company that identifies, develops, and markets ideas for new toys.¹³ After quoting a senior executive of a multibillion-dollar toy company who complained that there have been no exciting new toy ideas for years, the case then chronicles how BIG attacks this problem—or rather, this opportunity.

BIG invites mothers, children, tinkerers, and retirees who have ideas for new toys to attend “Big Idea Hunts,” which it convenes in locations across the country. These guests present their ideas to a panel of experts whose intuition BIG executives have come to trust. When the panel sees a good idea, BIG licenses it from the inventor and over the next several months shapes the idea into a business plan with a working prototype that they believe will sell. BIG then licenses the product to a toy company, which produces and markets it through its own channels. The company has been extraordinarily successful at finding, developing, and deploying into the market a sequence of truly exciting growth products.

How can there be such a flowering of high-potential new product opportunities in BIG's system, and such a dearth of opportunities in the

large toy company? In discussing the case, students often suggest that the product developers in the toy company just aren't as creative, or that the executives of the major company are just too risk averse. If these diagnoses were true, the company would simply need to find more creative managers who could think outside the box. But a parade of people has cycled through the toy company, and none has been able to crack the apparent lack of exciting toy ideas. Why?

The answer lies in the process by which the ideas get shaped. Midlevel managers play a crucial role in *every* company's innovation process, as they shepherd partially formed ideas into fully fledged business plans in an effort to win funding from senior management. It is the middle managers who must decide which of the ideas that come bubbling in or up to them they will support and carry to upper management for approval, and which ideas they will simply allow to languish. This is a key reason why companies employ middle managers in the first place. Their job is to sift the good ideas from the bad and to make good ideas so much better that they readily secure funding from senior management.

How do they sift and shape? Middle managers typically hesitate to throw their weight behind new product concepts whose market is not assured. If a market fails to materialize, the company will have wasted millions of dollars. The system therefore mandates that midlevel managers support their proposals with credible data on the size and growth potential of the markets that each idea targets. Opinions and feedback from significant customers add immeasurably to the credibility of claims that an idea has potential. Where does this evidence come from, given that the product hasn't yet been fully developed? It typically comes from existing customers and markets for similar products that have been successful in the past.

Personal factors are at work in this shaping process, too. Managers who back ideas that flop often find their prospects for promotion effectively truncated. In fact, ambitious managers hesitate even to propose ideas that senior managers are not likely to approve. If they favor an idea that their superiors subsequently judge to be weak, their reputation for good judgment can be tarnished among the very executives they hope to impress. Furthermore, companies' management development programs rarely leave their most talented middle managers in a position for longer than a few years—they move them to new assignments to broaden their

skills and experience. What this means, however, is that middle managers who want a reputation for delivering results will be inclined to promote only those new-growth ideas that will pay off within the time that they reside in that particular job.

The process of sorting through and packaging ideas into plans that can win funding, in other words, shapes those ideas to resemble the ideas that were approved and became successful in the past. The processes have in fact evolved to weed out business proposals that target markets where demand might be small. The problem for growth-seeking managers, of course, is that the exciting growth markets of tomorrow are small today.

This is why the senior managers at the major toy company and at BIG can live in the same world and yet see such different things. In every sizable company, not just in the toy business, the set of ideas that has been processed and packaged for top management approval is *very* different from the population of ideas that is bubbling at the bottom.

A dearth of good ideas is rarely the core problem in a company that struggles to launch exciting new-growth businesses. The problem is in the shaping process. Potentially innovative new ideas seem inexorably to be recast into attempts to make existing customers still happier. We believe that many of the ideas that emerge from this packaging and shaping process as me-too innovations could just as readily be shaped into business plans that create truly disruptive growth. Managers who understand these forces and learn to harness them in making key decisions will develop successful new-growth businesses much more consistently than historically has seemed possible.¹⁴

Where Predictability Comes From: Good Theory

The quest for predictability in an endeavor as complex as innovation is not quixotic. What brings predictability to any field is a body of well-researched *theory*—contingent statements of what causes what and why. Executives often discount the value of management theory because it is associated with the word *theoretical*, which connotes *impractical*. But theory is consummately practical. The law of gravity, for example, actually is a

theory—and it is useful. It allows us to predict that if we step off a cliff, we will fall.¹⁵

Even though most managers don't think of themselves as being theory driven, they are in reality voracious consumers of theory. Every time managers make plans or take action, it is based on a mental model in the back of their heads that leads them to believe that the action being taken will lead to the desired result.¹⁶ The problem is that managers are rarely aware of the theories they are using—and they often use the wrong theories for the situation they are in. It is the absence of conscious, trustworthy theories of cause and effect that makes success in building new businesses seem random.

To help executives to know whether and when they can trust the recommendations from management books or articles (including this one!) that they read for guidance as they build their businesses, we describe in the following sections a model of how good theories are built and used. We will repeatedly return to this model to illustrate how bad theory has caused growth builders to stumble in the past, and how the use of sound theory can remove many of the causes of failure.¹⁷

How Theories Are Built

The process of building solid theory has been researched in several disciplines, and scholars seem to agree that it proceeds in three stages. It begins by describing the phenomenon that we wish to understand. In physics, the phenomenon might be the behavior of high-energy particles. In the building of new businesses, the phenomena of interest are the things that innovators do in their efforts to succeed, and what the results of those actions are. Bad management theory results when researchers impatiently observe one or two success stories and then assume that they have seen enough.

After the phenomenon has been thoroughly characterized, researchers can then begin the second stage, which is to classify the phenomenon into categories. Juvenile-onset versus adult-onset diabetes is an example from medicine. Vertical and horizontal integration are categories of corporate diversification. Researchers need to categorize in order to highlight the most meaningful differences in the complex array of phenomena.

In the third stage, researchers articulate a theory that asserts what causes the phenomenon to occur, and why. The theory must also show whether and why the same causal mechanism might result in different outcomes, depending on the category or situation. The process of theory building is iterative, as researchers and managers keep cycling through these three steps, refining their ability to predict what actions will cause what results, under what circumstances.^{[18](#)}

Getting the Categories Right

The middle stage in this cycle—getting the categories right—is the key to developing useful theory. To see why, imagine going to your medical doctor seeking treatment for a particular set of symptoms, and before you have a chance to describe what ails you, the physician hands you a prescription and tells you to “take two of these and call me in the morning.”

“But how do you know this will help me?” you ask. “I haven’t told you what’s wrong.”

“Why wouldn’t it work?” comes the reply. “It cured my previous two patients just fine.”

No sane patient would accept medicine like this. But academics, consultants, and managers *routinely* dispense and accept remedies to management problems in this manner. When something has worked for a few “excellent” companies, they readily advise all other companies that taking the same medicine will be good for them as well. One reason why the outcomes of innovation appear to be random is that many who write about strategy and management ignore categorization. They observe a few successful companies and then write a book recommending that other managers do the same things to be successful too—without regard for the possibility that there might be some circumstances in which their favorite solution is a bad idea.^{[19](#)}

For example, thirty years ago many writers asserted that vertical integration was the key to IBM’s extraordinary success. But in the late 1990s we read that *non*-integration explained the triumph of outsourcing titans such as Cisco and Dell. The authors of “best practices” gospels such as these are no better than the doctor we introduced previously. The

critical question that these researchers need to resolve is, “What are the *circumstances* in which being integrated is competitively critical, and when is a strategy of partnering and outsourcing more likely to lead to success?”

Because theory-building scholars struggle to define the right and relevant categorization of circumstances, they rarely can define the circumstances immediately. Early studies almost always sort researchers’ observations into categories defined by the *attributes* of the phenomena themselves. Their assertions about the actions or events that lead to the results at this point can only be statements about *correlation* between attributes and results, not about causality. This is the best they can do in early theory-building cycles.

Consider, for illustration, the history of man’s attempts to fly. Early researchers observed strong correlations between being able to fly and having feathers and wings. Possessing these attributes had a high *correlation* with the ability to fly, but when humans attempted to follow the “best practices” of the most successful flyers by strapping feathered wings onto their arms, jumping off cliffs, and flapping hard, they were not successful—because as strong as the correlations were, the would-be aviators had not understood the fundamental causal mechanism that enabled certain animals to fly. It was not until Bernoulli’s study of fluid mechanics helped him articulate the mechanism through which airfoils create lift that human flight began to be *possible*. But understanding the mechanism itself still wasn’t enough to make the ability to fly perfectly *predictable*. Further research, entailing careful experimentation and measurement under various conditions, was needed to identify the *circumstances* in which that mechanism did and did not yield the desired result.

When the mechanism did not result in successful flight, researchers had to carefully decipher *why*—what it was about the circumstances in which the unexpected result occurred that led to failure. Once categories could be stated in terms of the different types of circumstances in which aviators might find themselves, then aviators could predict the conditions in which flight was and was not possible. They could develop technologies and techniques for successfully flying in those circumstances where flight was viable. And they could teach aviators how to recognize when the

circumstances were changing, so that they could change their methods appropriately. Understanding the mechanism (what causes what, and why) made flight possible; understanding the categories of circumstances made flight predictable.²⁰

How did aviation researchers know what the salient boundaries were between these categories of circumstance? As long as a change in conditions did not require change in the way the pilot flew the plane, the boundary between those conditions didn't matter. The circumstance boundaries that mattered were those that mandated a fundamental change in piloting techniques in order to keep the plane flying successfully.

Similar breakthroughs in management research increase the predictability of creating new-growth businesses. Getting beyond correlative assertions such as “Big companies are slow to innovate,” or “In our sample of successful companies, each was run by a CEO who had been promoted from within,” the breakthrough researcher first discovers the fundamental *causal* mechanism behind the phenomena of success. This allows those who are looking for “an answer” to get beyond the wings-and-feathers mind-set of copying the attributes of successful companies. The foundation for predictability only begins to be built when the researcher sees the same causal mechanism create a *different* outcome from what he or she expected—an anomaly. This prompts the researcher to define what it was about the circumstance or circumstances in which the anomaly occurred that caused the identical mechanism to result in a different outcome.

How can we tell what the right categorization is? As in aviation, a boundary between circumstances is salient only when executives need to use fundamentally different management techniques to succeed in the different circumstances defined by that boundary. If the same statement of cause and effect leads to the same outcome in two circumstances, then the distinction between those circumstances is not meaningful for the purposes of predictability.

To know for certain what circumstances they are in, managers also must know what circumstances they are *not* in. When collectively exhaustive and mutually exclusive *categories of circumstances* are defined, things get predictable: We can state what will cause what and why, and can predict how that statement of causality might vary by circumstance. Theories built

on categories of circumstances become easy for companies to employ, because managers live and work in circumstances, not in attributes.²¹

When managers ask questions such as “Does this apply to my industry?” or “Does it apply to service businesses as well as product businesses?” they really are probing to understand the circumstances. In our studies, we have observed that industry-based or product/service-based categorization schemes almost never constitute a useful foundation for reliable theory. *The Innovator’s Dilemma*, for example, described how the same mechanism that enabled entrant companies to up-end the leading established firms in disk drives and computers also toppled the leading companies in mechanical excavators, steel, retailing, motorcycles, accounting software, and motor controls.²² The circumstances that mattered were not what industry you were in. Rather, there was a mechanism—the resource allocation process—that caused the established leaders to win the competitive fights when an innovation was financially attractive to their business model. The same mechanism disabled the established leaders when they were attacked by disruptive innovators—whose products, profit models, and customers were not attractive.

*We can trust a theory only when its statement of what actions will lead to success describe how this will vary as a company’s circumstances change.*²³ This is a major reason why the outcomes of innovation efforts have seemed quite random: Shoddy categorization has led to one-size-fits-all recommendations that in turn have led to the wrong results in many circumstances.²⁴ It is the ability to begin thinking and acting in a circumstance-contingent way that brings predictability to our lives.

We often admire the intuition that successful entrepreneurs seem to have for building growth businesses. When they exercise their intuition about what actions will lead to the desired results, they really are employing theories that give them a sense of the right thing to do in various circumstances. These theories were not there at birth: They were learned through a set of experiences and mentors earlier in life.

If some people have learned the theories that we call intuition, then it is our hope that these theories also can be taught to others. This is our aspiration for this book. We hope to help managers who are trying to create new-growth businesses use the best research we have been able to assemble to learn how to match their actions to the circumstances in order to get the

results they need. As our readers use these ways of thinking over and over, we hope that the thought processes inherent in these theories can become part of their intuition as well.

We have written this book from the perspective of senior managers in established companies who have been charged to maintain the health and vitality of their firms. We believe, however, that our ideas will be just as valuable to independent entrepreneurs, start-up companies, and venture capital investors. Simply for purposes of brevity, we will use the term *product* in this book when we describe what a company makes or provides. We mean, however, for this to encompass product *and* service businesses, because the concepts in the book apply just as readily to both.

The Outline of This Book

The Innovator's Dilemma summarized a theory that explains how, under certain circumstances, the mechanism of profit-maximizing resource allocation causes well-run companies to get killed. *The Innovator's Solution*, in contrast, summarizes a set of theories that can guide managers who need to grow new businesses with predictable success—to become the disruptors rather than the disrruptees—and ultimately kill the well-run, established competitors. To succeed predictably, disruptors must be good theorists. As they shape their growth business to be disruptive, they must align every critical process and decision to fit the disruptive circumstance.

Because building successful growth businesses is such a vast topic, this book focuses on nine of the most important decisions that all managers must make in creating growth—decisions that represent key actions that drive success inside the black box of innovation. Each chapter offers a specific theory that managers can use to make one of these decisions in a way that greatly improves their probability of success. Some of this theory has emerged from our own studies, but we are indebted to many other scholars for much of what follows. Those whose work we draw upon have contributed to improving the predictability of business building because their assertions of causality have been built upon circumstance-based categories. It is because of their careful work that we believe that managers can begin using these theories explicitly as they make these decisions,

trusting that their predictions will be applicable and reliable, given the circumstances that they are in.

The following list summarizes the questions we address.

- [Chapter 2](#): How can we beat our most powerful competitors? What strategies will result in the competitors killing us, and what courses of action could actually give us the upper hand?
- [Chapter 3](#): What products should we develop? Which improvements over previous products will customers enthusiastically reward with premium prices, and which will they greet with indifference?
- [Chapter 4](#): Which initial customers will constitute the most viable foundation upon which to build a successful business?
- [Chapter 5](#): Which activities required to design, produce, sell, and distribute our product should our company do internally, and which should we rely upon our partners and suppliers to provide?
- [Chapter 6](#): How can we be sure that we maintain strong competitive advantages that yield attractive profits? How can we tell when commoditization is going to occur, and what can we do to keep earning attractive returns?
- [Chapter 7](#): What is the best organizational structure for this venture? What organizational unit(s) and which managers should contribute to and be responsible for its success?
- [Chapter 8](#): How do we get the details of a winning strategy right? When is flexibility important, and when will flexibility cause us to fail?
- [Chapter 9](#): Whose investment capital will help us succeed, and whose capital might be the kiss of death? What sources of money will help us most at different stages of our development?
- [Chapter 10](#): What role should the CEO play in sustaining the growth of the business? When should CEOs keep their hands off the new business, and when should they become involved?

The issues that we tackle in these chapters are critical, but they cannot constitute an exhaustive list of the questions that should be relevant to launching a new-growth business. We can simply hope that we have addressed the most important ones, so that although we cannot make the creation of new-growth businesses perfectly risk free, we *can* help managers take major steps in that direction.

NOTES

1. Although we have not performed a true meta-analysis, there are four recently published studies that seem to converge on this estimate that roughly one company in ten succeeds at sustaining growth. Chris Zook and James Allen found in their 2001 study *Profit from the Core* (Boston: Harvard Business School Press) that only 13 percent of their sample of 1,854 companies were able to grow consistently over a ten-year period. Richard Foster and Sarah Kaplan published a study that same year, *Creative Destruction* (New York: Currency/Doubleday), in which they followed 1,008 companies from 1962 to 1998. They learned that only 160, or about 16 percent of these firms, were able merely to survive this time frame, and concluded that the perennially outperforming company is a chimera, something that has never existed at all. Jim Collins also published his *Good to Great* (New York: HarperBusiness) in 2001, in which he examined a universe of 1,435 companies over thirty years (1965–1995). Collins found only 126, or about 9 percent, that had managed to outperform equity market averages for a decade or more. The Corporate Strategy Board's findings in *Stall Points* (Washington, DC: Corporate Strategy Board, 1988), which are summarized in detail in the text, show that 5 percent of companies in the *Fortune* 50 successfully maintained their growth, and another 4 percent were able to reignite some degree of growth after they had stalled. The studies all support our assertion that a 10 percent probability of succeeding in a quest for sustained growth is, if anything, a generous estimate.

2. Because all of these transactions included stock, “true” measures of the value of the different deals are ambiguous. Although when a deal actually closes, a definitive value can be fixed, the implied value of the transaction at the time a deal is announced can be useful: It signals what the relevant parties were willing to pay and accept at a point in time. Stock price changes subsequent to the deal's announcement are often a function of other, exogenous events having little to do with the deal itself. Where possible, we have used the value of the deals at announcement, rather than upon closing. Sources of data on these various transactions include the following:

NCR

“Fatal Attraction (AT&T's Failed Merger with NCR),” *The Economist*, 23 March 1996.

“NCR Spinoff Completes AT&T Restructure Plan,” *Bloomberg Business News*, 1 January 1997.

McCaw and AT&T Wireless Sale

The Wall Street Journal, 21 September 1994.

“AT&T Splits Off AT&T Wireless,” AT&T news release, 9 July 2001.

AT&T, TCI, and MediaOne

“AT&T Plans Mailing to Sell TCI Customers Phone, Web Services,” *The Wall Street Journal*, 10 March 1999.

- “The AT&T-Mediaone Deal: What the FCC Missed,” *Business Week*, 19 June 2000.
- “AT&T Broadband to Merge with Comcast Corporation in \$72 Billion Transaction,” AT&T news release, 19 December 2001.
- “Consumer Groups Still Questioning Comcast-AT&T Cable Merger,” Associated Press Newswires, 21 October 2002.

3. Cabot’s stock price outperformed the market between 1991 and 1995 as it refocused on its core business, for two reasons. On one side of the equation, demand for carbon black increased in Asia and North America as car sales surged, thereby increasing the demand for tires. On the supply side, two other American-based producers of carbon black exited the industry because they were unwilling to make the requisite investment in environmental controls, thereby increasing Cabot’s pricing power. Increased demand and reduced supply translated into a tremendous increase in the profitability of Cabot’s traditional carbon black operations, which was reflected in the company’s stock price. Between 1996 and 2000, however, its stock price deteriorated again, reflecting the dearth of growth prospects.

4. An important study of companies’ tendency to make investments that fail to create growth was done by Professor Michael C. Jensen: “The Modern Industrial Revolution, Exit, and the Failure of Internal Control Systems,” *Journal of Finance* (July 1993): 831–880. Professor Jensen also delivered this paper as his presidential address to the American Finance Association. Interestingly, many of the firms that Jensen cites as having productively reaped growth from their investments were disruptive innovators—a key concept in this book.

Our unit of analysis in this book, as in Jensen’s work, is the individual firm, not the larger system of growth creation made manifest in a free market, capitalist economy. Works such as Joseph Schumpeter’s *Theory of Economic Development* (Cambridge, MA: Harvard University Press, 1934) and *Capitalism, Socialism, and Democracy* (New York: London, Harper & Brothers, 1942) are seminal, landmark works that address the environment in which firms function. Our assertion here is that whatever the track record of free market economies in generating growth at the macro level, the track record of individual firms is quite poor. It is the performance of firms within a competitive market to which we hope to contribute.

5. This simple story is complicated somewhat by the market’s apparent incorporation of an expected “fade” in any company’s growth rate. Empirical analysis suggests that the market does not expect any company to grow, or even survive, forever. It therefore seems to incorporate into current prices a foreseen decline in growth rates from current levels and the eventual dissolution of the firm. This is the reason for the importance of terminal values in most valuation models. This fade period is estimated using regression analysis, and estimates vary widely. So, strictly speaking, if a company is expected to grow at 5 percent with a fade period of forty years, and five years into that forty-year period it is still growing at 5 percent, the stock price would rise at rates that generated economic returns for shareholders, because the forty-year fade period would start over. However, because this qualification applies to companies growing at 5 percent as well as those growing at 25 percent, it does not change the point we wish to make; that is, that the market is a harsh taskmaster, and merely meeting expectations does not generate meaningful reward.

6. On average over their long histories, of course, faster-growing firms yield higher returns. However, the faster-growing firm will have produced higher returns than the slower-growing firm only for investors in the past. If markets discount efficiently, then the investors who reap above-average returns are those who were fortunate enough to have bought shares in the past when the future growth rate had not been fully discounted into the price of the stock. Those who bought when the future growth potential already had been discounted into the share price would not receive an above-market return. An excellent reference for this argument can be found in Alfred

Rappaport and Michael J. Mauboussin, *Expectations Investing: Reading Stock Prices for Better Returns* (Boston: Harvard Business School Press, 2001). Rappaport and Mauboussin guide investors in methods to detect when a market's expectations for a company's growth might be incorrect.

7. These were the closing market prices for these companies' common shares on August 21, 2002. There is no significance to that particular date: It is simply the time when the analysis was done. HOLT Associates, a unit of Credit Suisse First Boston (CSFB), performed these calculations using proprietary methodology applied to publicly available financial data. The percent future is a measure of how much a company's current stock price can be attributed to current cash flows and how much is due to investors' expectations of future growth and performance. As CSFB/HOLT defines it,

The percent future is the percentage of the total market value that the market assigns to the company's expected future investment. Percent future begins with the total market value (debt plus equity) less that portion attributed to the present value of existing assets and investments and divides this by the total market value of debt and equity.

CSFB/Holt calculates the present value of existing assets as the present value of the cash flows associated with the assets' wind down and the release of the associated nondepreciating working capital. The HOLT CFROI valuation methodology includes a forty-year fade of returns equal to the total market's average returns.

Percent Future = [Total Debt and Equity (market) – Present Value Existing Assets] / [Total Debt and Equity (market)]

The companies listed in [table 1-1](#) are not a sequential ranking of *Fortune* 500 companies, because some of the data required to perform these calculations were not available for some companies. The companies listed in this table were chosen only for illustrative purposes, and were not chosen in any way to suggest that any company's share price is likely to increase or decline. For more information on the methodology that HOLT used, see <http://www.holtvalue.com>.

8. See *Stall Points* (Washington, DC: Corporate Strategy Board, 1998).

9. In the text we have focused only on the pressure that equity markets impose on companies to grow, but there are many other sources of intense pressure. We'll mention just a couple here. First, when a company is growing, there are increased opportunities for employees to be promoted into new management positions that are opening up above them. Hence, the potential for growth in managerial responsibility and capability is much greater in a growing firm than in a stagnant one. When growth slows, managers sense that their possibilities for advancement will be constrained not by their personal talent and performance, but rather by how many years must pass before the more senior managers above them will retire. When this happens, many of the most capable employees tend to leave the company, affecting the company's abilities to regenerate growth.

Investment in new technologies also becomes difficult. When a growing firm runs out of capacity and must build a new plant or store, it is easy to employ the latest technology. When a company has stopped growing and has excess manufacturing capacity, proposals to invest in new technology typically do not fare well, since the full capital cost and the average manufacturing cost of producing with the new technology are compared against the marginal cost of producing in a fully depreciated plant. As a result, growing firms typically have a technology edge over slow-growth competitors. But that advantage is not rooted so much in the visionary wisdom of the managers as it is in the difference in the circumstances of growth versus no growth.

10. Detailed support for this estimate is provided in note 1.

11. For example, see James Brian Quinn, *Strategies for Change: Logical Incrementalism* (Homewood, IL: R.D. Irwin, 1980). Quinn suggests that the first step that corporate executives need to take in building new businesses is to “let a thousand flowers bloom,” then tend the most promising and let the rest wither. In this view, the key to successful innovation lies in choosing the right flowers to tend—and that decision must rely on complex intuitive feelings, calibrated by experience.

More recent work by Tom Peters (*Thriving on Chaos: Handbook for a Management Revolution* [New York: Knopf/Random House, 1987]) urges innovating managers to “fail fast”—to pursue new business ideas on a small scale and in a way that generates quick feedback about whether an idea is viable. Advocates of this approach urge corporate executives not to punish failures because it is only through repeated attempts that successful new businesses will emerge.

Others draw on analogies with biological evolution, where mutations arise in what appear to be random ways. Evolutionary theory posits that whether a mutant organism thrives or dies depends on its fit with the “selection environment”—the conditions within which it must compete against other organisms for the resources required to thrive. Hence, believing that good and bad innovations pop up randomly, these researchers advise corporate executives to focus on creating a “selection environment” in which viable new business ideas are culled from the bad as quickly as possible. Gary Hamel, for example, advocates creating “Silicon Valley inside”—an environment in which existing structures are constantly dismantled, recombined in novel ways, and tested, in order to stumble over something that actually works. (See Gary Hamel, *Leading the Revolution* [Boston: Harvard Business School Press, 2001].)

We are not critical of these books. They can be very helpful, given the present state of understanding, because if the processes that create innovations were indeed random, then a context within which managers could accelerate the creation and testing of ideas would indeed help. But if the process is *not* intrinsically random, as we assert, then addressing only the context is treating the symptom, not the source of the problem.

To see why, consider the studies of 3M’s celebrated ability to create a stream of growth-generating innovations. A persistent highlight of these studies is 3M’s “15 percent rule”: At 3M, many employees are given 15 percent of their time to devote to developing their own ideas for new-growth businesses. This “slack” in how people spend their time is supported by a broadly dispersed capital budget that employees can tap in order to fund their would-be growth engines on a trial basis.

But what guidance does this policy give to a bench engineer at 3M? She is given 15 percent “slack” time to dedicate to creating new-growth businesses. She is also told that whatever she comes up with will be subject first to internal market selection pressures, then external market selection pressures. All this is helpful information. But none of it helps that engineer create a new idea, or decide which of the several ideas she might create are worth pursuing further. This plight generalizes to managers and executives at all levels in an organization. From bench engineer to middle manager to business unit head to CEO, it is not enough to occupy oneself only with creating a context for innovation that sorts the fruits of that context. Ultimately, every manager must create something of substance, and the success of that creation lies in the decisions managers must make.

All of these approaches create an “infinite regress.” By bringing the market “inside,” we have simply backed up the problem: How can managers decide which ideas will be developed to the point at which they can be subjected to the selection pressures of their internal market? Bringing the market still deeper inside simply creates the same conundrum. Ultimately, innovators must judge what they will work on and how they will do it—and what they should consider when making those decisions is what is in the black box. The acceptance of randomness in innovation, then, is not a stepping-stone on the way to greater understanding; it is a barrier.

Dr. Gary Hamel was one of the first scholars of this problem to raise with Professor Christensen the possibility that the management of innovation actually has the potential to yield predictable results. We express our thanks to him for his helpful thoughts.

12. The scholars who introduced us to these forces are Professor Joseph Bower of the Harvard Business School and Professor Robert Burgelman of the Stanford Business School. We owe a deep intellectual debt to them. See Joseph L. Bower, *Managing the Resource Allocation Process* (Homewood, IL: Richard D. Irwin, 1970); Robert Burgelman and Leonard Sayles, *Inside Corporate Innovation* (New York: Free Press, 1986); and Robert Burgelman, *Strategy Is Destiny* (New York: Free Press, 2002).

13. Clayton M. Christensen and Scott D. Anthony, “What’s the BIG Idea?” Case 9-602-105 (Boston: Harvard Business School, 2001).

14. We have consciously chosen phrases such as “increase the probability of success” because business building is unlikely ever to become perfectly predictable, for at least three reasons. The first lies in the nature of competitive marketplaces. Companies whose actions were perfectly predictable would be relatively easy to defeat. Every company therefore has an interest in behaving in deeply unpredictable ways. A second reason is the computational challenge associated with any system with a large number of possible outcomes. Chess, for example, is a fully determined game: After White’s first move, Black should always simply resign. But the number of possible games is so great, and the computational challenge so overwhelming, that the outcomes of games even between supercomputers remain unpredictable. A third reason is suggested by complexity theory, which holds that even fully determined systems that do not outstrip our computational abilities can still generate deeply random outcomes. Assessing the extent to which the outcomes of innovation can be predicted, and the significance of any residual uncertainty or unpredictability, remains a profound theoretical challenge with important practical implications.

15. The challenge of improving predictability has been addressed somewhat successfully in certain of the natural sciences. Many fields of science appear today to be cut and dried—predictable, governed by clear laws of cause and effect, for example. But it was not always so: Many happenings in the natural world seemed very random and unfathomably complex to the ancients and to early scientists. Research that adhered carefully to the scientific method brought the predictability upon which so much progress has been built. Even when our most advanced theories have convinced scientists that the world is not deterministic, at least the phenomena are predictably random.

Infectious diseases, for example, at one point just seemed to strike at random. People didn’t understand what caused them. Who survived and who did not seemed unpredictable. Although the outcome seemed random, however, the process that led to the results was not random—it just was not sufficiently understood. With many cancers today, as in the venture capitalists’ world, patients’ probabilities for survival can only be articulated in percentages. This is not because the outcomes are unpredictable, however. We just do not yet understand the process.

16. Peter Senge calls theories *mental models* (see Peter Senge, *The Fifth Discipline* [New York: Bantam Doubleday Dell, 1990]). We considered using the term *model* in this book, but opted instead to use the term *theory*. We have done this to be provocative, to inspire practitioners to value something that is indeed of value.

17. A full description of the process of theory building and of the ways in which business writers and academics ignore and violate the fundamental principles of this process is available in a paper that is presently under review, “The Process of Theory Building,” by Clayton Christensen, Paul Carlile, and David Sundahl. Paper or electronic copies are available from Professor Christensen’s office, cchristensen@hbs.edu. The scholars we have relied upon in synthesizing the model of theory building presented in this paper (and only very briefly summarized in this book) are, in alphabetical

order, E. H. Carr, *What Is History?* (New York: Vintage Books, 1961); K. M. Eisenhardt, "Building Theories from Case Study Research," *Academy of Management Review* 14, no. 4 (1989): 532–550; B. Glaser and A. Strauss, *The Discovery of Grounded Theory: Strategies of Qualitative Research* (London: Wiedenfeld and Nicholson, 1967); A. Kaplan, *The Conduct of Inquiry: Methodology for Behavioral Research* (Scranton, PA: Chandler, 1964); R. Kaplan, "The Role for Empirical Research in Management Accounting," *Accounting, Organizations and Society* 4, no. 5 (1986): 429–452; T. Kuhn, *The Structure of Scientific Revolutions* (Chicago: University of Chicago Press, 1962); M. Poole and A. Van de Ven, "Using Paradox to Build Management and Organization Theories," *Academy of Management Review* 14, no. 4 (1989): 562–578; K. Popper, *The Logic of Scientific Discovery* (New York: Basic Books, 1959); F. Roethlisberger, *The Elusive Phenomena* (Boston: Harvard Business School Division of Research, 1977); Arthur Stinchcombe, "The Logic of Scientific Inference," [chapter 2](#) in *Constructing Social Theories* (New York: Harcourt, Brace & World, 1968); Andrew Van de Ven, "Professional Science for a Professional School," in *Breaking the Code of Change*, eds. Michael Beer and Nitin Nohria (Boston: Harvard Business School Press, 2000); Karl E. Weick, "Theory Construction as Disciplined Imagination," *Academy of Management Review* 14, no. 4, (1989): 516–531; and R. Yin, *Case Study Research* (Beverly Hills, CA: Sage Publications, 1984).

[18.](#) What we are saying is that the success of a theory should be measured by the accuracy with which it can predict outcomes across the entire range of situations in which managers find themselves. Consequently, we are not seeking "truth" in any absolute, Platonic sense; our standard is practicality and usefulness. If we enable managers to achieve the results they seek, then we will have been successful. Measuring the success of theories based on their usefulness is a respected tradition in the philosophy of science, articulated most fully in the school of logical positivism. For example, see R. Carnap, *Empiricism, Semantics and Ontology* (Chicago: University of Chicago Press, 1956); W. V. O. Quine, *Two Dogmas of Empiricism* (Cambridge, MA: Harvard University Press, 1961); and W. V. O. Quine, *Epistemology Naturalized*. (New York: Columbia University Press, 1969).

[19.](#) This is a serious deficiency of much management research. Econometricians call this practice "sampling on the dependent variable." Many writers, and many who think of themselves as serious academics, are so eager to prove the worth of their theories that they studiously avoid the discovery of anomalies. In case study research, this is done by carefully selecting examples that support the theory. In more formal academic research, it is done by calling points of data that don't fit the model "outliers" and finding a justification for excluding them from the statistical analysis. Both practices seriously limit the usefulness of what is written. It actually is the discovery of phenomena that the existing theory cannot explain that enables researchers to build better theory that is built upon a better classification scheme. We need to do *anomaly-seeking* research, not anomaly-avoiding research.

We have urged doctoral students who are seeking potentially productive research questions for their thesis research to simply ask when a "fad" theory won't work—for example, "When is process reengineering a bad idea?" Or, "Might you ever want to outsource something that *is* your core competence, and do internally something that is *not* your core competence?" Asking questions like this almost always improves the validity of the original theory. This opportunity to improve our understanding often exists even for very well done, highly regarded pieces of research. For example, an important conclusion in Jim Collins's extraordinary book *From Good to Great* (New York: HarperBusiness, 2001) is that the executives of these successful companies weren't charismatic, flashy men and women. They were humble people who respected the opinions of others. A good opportunity to extend the validity of Collins's research is to ask a question such as, "Are there circumstances in which you actually *don't* want a humble, noncharismatic CEO?" We suspect that

there are—and defining the different circumstances in which charisma and humility are virtues and vices could do a great service to boards of directors.

[20.](#) We thank Matthew Christensen of the Boston Consulting Group for suggesting this illustration from the world of aviation as a way of explaining how getting the categories right is the foundation for bringing predictability to an endeavor. Note how important it was for researchers to discover the circumstances in which the mechanisms of lift and stabilization did *not* result in successful flight. It was the very search for failures that made success consistently possible. Unfortunately, many of those engaged in management research seem anxious *not* to spotlight instances their theory did not accurately predict. They engage in anomaly-avoiding, rather than anomaly-seeking, research and as a result contribute to the perpetuation of unpredictability. Hence, we lay much responsibility for the perceived unpredictability of business building at the feet of the very people whose business it is to study and write about these problems. We may, on occasion, succumb to the same problem. We can state that in developing and refining the theories summarized in this book, we have truly sought to discover exceptions or anomalies that the theory would not have predicted; in so doing, we have improved the theories considerably. But anomalies remain. Where we are aware of these, we have tried to note them in the text or notes of this book. If any of our readers are familiar with anomalies that these theories cannot yet explain, we invite them to teach us about them, so that together we can work to improve the predictability of business building further.

[21.](#) In studies of how companies deal with technological change, for example, early researchers suggested attribute-based categories such as incremental versus radical change and product versus process change. Each categorization supported a theory, based on correlation, about how entrant and established companies were likely to be affected by the change, and each represented an improvement in predictive power over earlier categorization schemes. At this stage of the process there rarely is a best-by-consensus theory, because there are so many attributes of the phenomena. Scholars of this process have broadly observed that this confusion is an important but unavoidable stage in building theory. See Thomas Kuhn, *The Structure of Scientific Revolutions* (Chicago: University of Chicago Press, 1962). Kuhn chronicles at length the energies expended by advocates of various competing theories at this stage, prior to the advent of a paradigm.

In addition, one of the most influential handbooks for management and social science research was written by Barney G. Glaser and Anselm L. Strauss (*The Discovery of Grounded Theory: Strategies of Qualitative Research* [London: Wiedenfeld and Nicholson, 1967]). Although they name their key concept “grounded theory,” the book really is about categorization, because that process is so central to the building of valid theory. Their term “substantive theory” is similar to our term “attribute-based categories.” They describe how a knowledge-building community of researchers ultimately succeeds in transforming their understanding into “formal theory,” which we term “circumstance-based categories.”

[22.](#) Clayton M. Christensen, *The Innovator's Dilemma: When New Technologies Cause Great Firms to Fail* (Boston: Harvard Business School Press, 1997).

[23.](#) Managers need to know whether a theory applies in their situation if they are to trust it. A very useful book on this topic is Robert K. Yin's *Case Study Research: Design and Methods* (Beverly Hills, CA: Sage Publications, 1984). Building on Yin's concept, we would say that the breadth of applicability of a theory, which Yin calls its *external validity*, is established by the soundness of its categorization scheme. There is no other way to gauge where theory applies and where it does not. To see why, consider the disruptive innovation model that emerged from the study of the disk drive industry in the early chapters of *The Innovator's Dilemma*. The concern that readers of the disk drive study raised, of course, was whether the theory applied to other industries as well. *The Innovator's Dilemma* tried to address these concerns by showing how the same theory that explained

who succeeded and failed in disk drives also explained what happened in mechanical excavators, steel, retailing, motorcycles, accounting software, motor controls, diabetes care, and computers. The variety was chosen to establish the breadth of the theory's applicability. But this didn't put concerns to rest. Readers continued to ask whether the theory applied to chemicals, to database software, and so on.

Applying any theory to industry after industry cannot prove its applicability because it will always leave managers wondering if there is something different about their current circumstances that renders the theory untrustworthy. A theory can confidently be employed in prediction only when the categories that define its contingencies are clear. Some academic researchers, in a well-intentioned effort not to overstep the validity of what they can defensibly claim and not claim, go to great pains to articulate the "boundary conditions" within which their findings can be trusted. This is all well and good. But unless they concern themselves with defining what the other circumstances are that lie beyond the "boundary conditions" of their own study, they circumscribe what they can contribute to a body of useful theory.

[24](#). An illustration of how important it is to get the categories right can be seen in the fascinating juxtaposition of two recent, solidly researched books by very smart students of management and competition that make compelling cases for diametrically opposite solutions to a problem. Each team of researchers addresses the same underlying problem—the challenge of delivering persistent, profitable growth. In *Creative Destruction* (New York: Currency/Doubleday, 2001), Richard Foster and Sarah Kaplan argue that if firms hope to create wealth sustainably and at a rate comparable to the broader market, they must be willing to explore radically new business models and visit upon themselves the tumult that characterizes the capital markets. At the same time, another well-executed study, *Profit from the Core* (Boston: Harvard Business School Press, 2001), by Bain consultants Chris Zook and James Allen, drew upon the same phenomenological evidence—that only a tiny minority of companies are able to sustain above-market returns for a significant time. But *their* book encourages companies to focus on and improve their established businesses rather than attempt to anticipate or even respond to the vagaries of equity investors by seeking to create new growth in less-related markets. Whereas Foster and Kaplan motivate their findings in terms of the historical suitability of incrementalism in a context of competitive continuity and argue for more radical change in light of today's exigencies, Zook and Allen hold that focus is timeless and remains the key to success. Their prescriptions are mutually exclusive. Whose advice should we follow? At present, managers grappling with their own growth problems have no choice but to pick a camp based on the reputations of the authors and the endorsements on the dust jacket. The answer is that there is a great opportunity for circumstance-focused researchers to build on the valuable groundwork that both sets of authors have established. The question that now needs answering is: What are the circumstances in which focusing on or near the core will yield sustained profit and growth, and what are the circumstances in which broader, Fosteresque creative destruction is the approach that will succeed?

CHAPTER TWO

HOW CAN WE BEAT OUR MOST POWERFUL COMPETITORS?

How can we know in advance of the battle whether we're going to be able to beat the competition? Why has disruption proven to be such a consistently effective strategy for causing strong incumbent competitors to flee from their entrant attackers, rather than fight them? How can we shape our business idea into one of these disruptive strategies? Can we really predict the winners in a race for innovative growth? What if we could choose our competitive battles knowing we could win nearly every time? What if we knew in advance which growth strategies would succeed, and which would fail?

Managers have long sought ways to predict the outcome of competitive fights. Some have looked at the attributes of the companies involved, predicting that larger companies with more resources to throw at a problem will beat the smaller competitors. It's interesting how often the CEOs of large, resource-rich companies base their strategies upon this theory, despite repeated evidence that the level of resources committed often bears little relationship to the outcome.

Others have considered the attributes of the change: When innovations are incremental, the established, leading firms in an industry are likely to reinforce their dominance; however, compared with entrants, they will be conservative and ineffective in exploiting breakthrough innovation.¹ We noted in the introduction that predictions based on attribute-based categories, as these are, prove frustratingly undependable.

Our ongoing study of innovation suggests another way to understand when incumbents will win, and when the entrants are likely to beat them.

The Innovator's Dilemma identified two distinct categories—sustaining and disruptive—based on the *circumstances* of innovation. In *sustaining circumstances*—when the race entails making better products that can be sold for more money to attractive customers—we found that incumbents almost always prevail. In *disruptive circumstances*—when the challenge is to commercialize a simpler, more convenient product that sells for less money and appeals to a new or unattractive customer set—the entrants are likely to beat the incumbents. This is the phenomenon that so frequently defeats successful companies. It implies, of course, that the best way for upstarts to attack established competitors is to disrupt them.

Few technologies or business ideas are intrinsically sustaining or disruptive in character. Rather, their disruptive impact must be molded into strategy as managers shape the idea into a plan and then implement it. Successful new-growth builders know—either intuitively or explicitly—that disruptive strategies greatly increase the odds of competitive success.

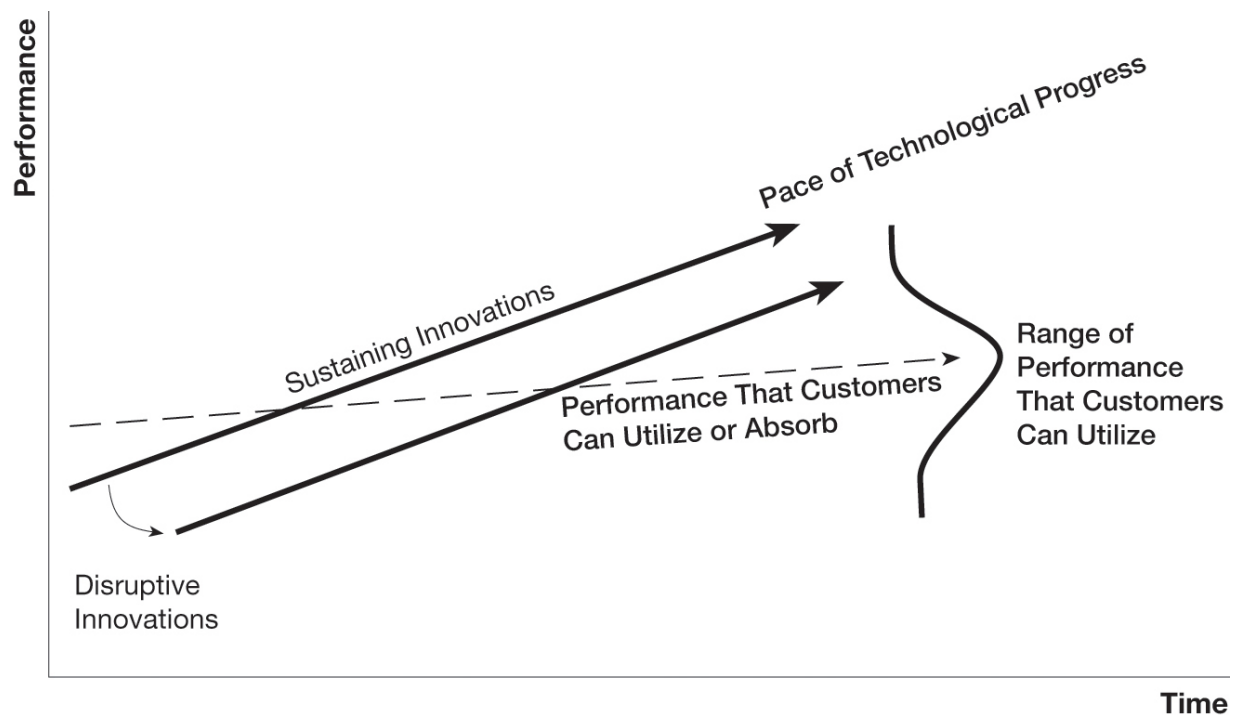
This chapter's purpose is to review the disruptive innovation model from the perspective of both the disruptee *and* the disruptor in order to help growth builders shape their strategies so that they pick disruptive fights they can win. Because disruption happens whether we want it or not, this chapter will also help managers of established companies capture disruptive growth, instead of seeing their companies get killed by it.

The Disruptive Innovation Model

The Innovator's Dilemma identified three critical elements of disruption, as depicted in [figure 2-1](#). First, in every market there is a rate of improvement that customers can utilize or absorb, represented by the dotted line sloping gently upward across the chart. For example, the automobile companies keep giving us new and improved engines, but we can't utilize all the performance that they make available under the hood. Factors such as traffic jams, speed limits, and safety concerns constrain how much performance we can use.

FIGURE 2-1

The disruptive innovation model



To simplify the chart, we depict customers' ability to utilize improvement as a single line. In reality, there is a distribution of customers around this median: There are many such lines, or tiers, in a market—a range indicated by the distribution curve at the right. Customers in the highest or most demanding tiers may never be satisfied with the best that is available, and those in the lowest or least demanding tiers can be oversatisfied with very little.² This dotted line represents technology that is “good enough” to serve customers' needs.

Second, in every market there is a distinctly different trajectory of improvement that innovating companies provide as they introduce new and improved products. This pace of technological progress almost always outstrips the ability of customers in any given tier of the market to use it, as the more steeply sloping solid lines in [figure 2-1](#) suggest. Thus, a company whose products are squarely positioned on mainstream customers' current needs today will probably overshoot what those same customers are able to utilize in the future. This happens because companies keep striving to

make better products that they can sell for higher profit margins to not-yet-satisfied customers in more demanding tiers of the market.

To visualize this, think back to 1983 when people first started using personal computers for word processing. Typists often had to stop their fingers to let the Intel 286 chip inside catch up. As depicted at the left side of [figure 2-1](#), the technology was not good enough. But today's processors offer much more speed than mainstream customers can use—although there are still a few unsatisfied customers in the most demanding tiers of the market who need even faster chips.

The third critical element of the model is the distinction between sustaining and disruptive innovation. A *sustaining innovation* targets demanding, high-end customers with better performance than what was previously available. Some sustaining innovations are the incremental year-by-year improvements that all good companies grind out. Other sustaining innovations are breakthrough, leapfrog-beyond-the-competition products. It doesn't matter how technologically difficult the innovation is, however: The established competitors almost always win the battles of sustaining technology. Because this strategy entails making a better product that they can sell for higher profit margins to their best customers, the established competitors have powerful motivations to fight sustaining battles. And they have the resources to win.

Disruptive innovations, in contrast, don't attempt to bring better products to established customers in existing markets. Rather, they disrupt and redefine that trajectory by introducing products and services that are not as good as currently available products. But disruptive technologies offer other benefits—typically, they are simpler, more convenient, and less expensive products that appeal to new or less-demanding customers.³

Once the disruptive product gains a foothold in new or low-end markets, the improvement cycle begins. And because the pace of technological progress outstrips customers' abilities to use it, the previously not-good-enough technology eventually improves enough to intersect with the needs of more demanding customers. When that happens, the disruptors are on a path that will ultimately crush the incumbents. This distinction is important for innovators seeking to create new-growth businesses. Whereas the current leaders of the industry almost always

triumph in battles of sustaining innovation, successful disruptions have been launched most often by entrant companies.⁴

Disruption has a paralyzing effect on industry leaders. With resource allocation processes designed and perfected to support sustaining innovations, they are constitutionally unable to respond. They are always motivated to go up-market, and almost never motivated to defend the new or low-end markets that the disruptors find attractive. We call this phenomenon *asymmetric motivation*. It is the core of the innovator's dilemma, and the beginning of the innovator's solution.

Disruption at Work: How Minimills Upended Integrated Steel Companies

The disruption of integrated steel mills by minimills, whose history was partially reviewed in *The Innovator's Dilemma*, offers a classic example of why established leaders are so much easier to beat if the idea for a new product or business is shaped into a disruption.

Historically, most of the world's steel has come from massive integrated mills that do everything from reacting iron ore, coke, and limestone in blast furnaces to rolling finished products at the other end. It costs about \$8 billion to build a huge new integrated mill today. Minimills, in contrast, melt scrap steel in electric arc furnaces—cylinders that are approximately twenty meters in diameter and ten meters tall. Because they can produce molten steel cost-effectively in such a small chamber, minimills don't need the massive-scale rolling and finishing operations that are required to handle the output of efficient blast furnaces—which is why they are called *minimills*. Most important, though, minimills' straightforward technology can make steel of any given quality for 20 percent lower cost than an integrated mill.

Steel is a commodity. You would think that every integrated steel company in the world would have aggressively adopted the straightforward, lower-cost minimill technology. Yet as of 2000 not a single integrated steel company had successfully invested in a minimill, even as the minimills had grown to account for nearly half of North America's steel production and a significant share of other markets as well.⁵

We can explain why something that makes so much sense has been so difficult for the integrated mills. Minimills first became technologically viable in the mid-1960s. Because they melt scrap of uncertain and varying chemistry in their electric arc furnaces, the quality of the steel that minimills initially could produce was poor. In fact, the only market that would accept the output of minimills was the concrete reinforcing bar (rebar) market. The specifications for rebar are loose, so this was an ideal market for products of low and variable quality.

As the minimills attacked the rebar market, the integrated mills were happy to be rid of that dog-eat-dog commodity business. Because of the differences in their cost structures and the opportunities for investment that they each faced, the rebar market looked very different to the disruptee and the disruptor. For integrated producers, gross profit margins on rebar often hovered near 7 percent, and the entire product category accounted for only 4 percent of the industry's tonnage. It was the least attractive of any tier of the market in which they might invest to grow. So as the minimills established a foothold in the rebar market, the integrated mills reconfigured their rebar lines to make more profitable products.

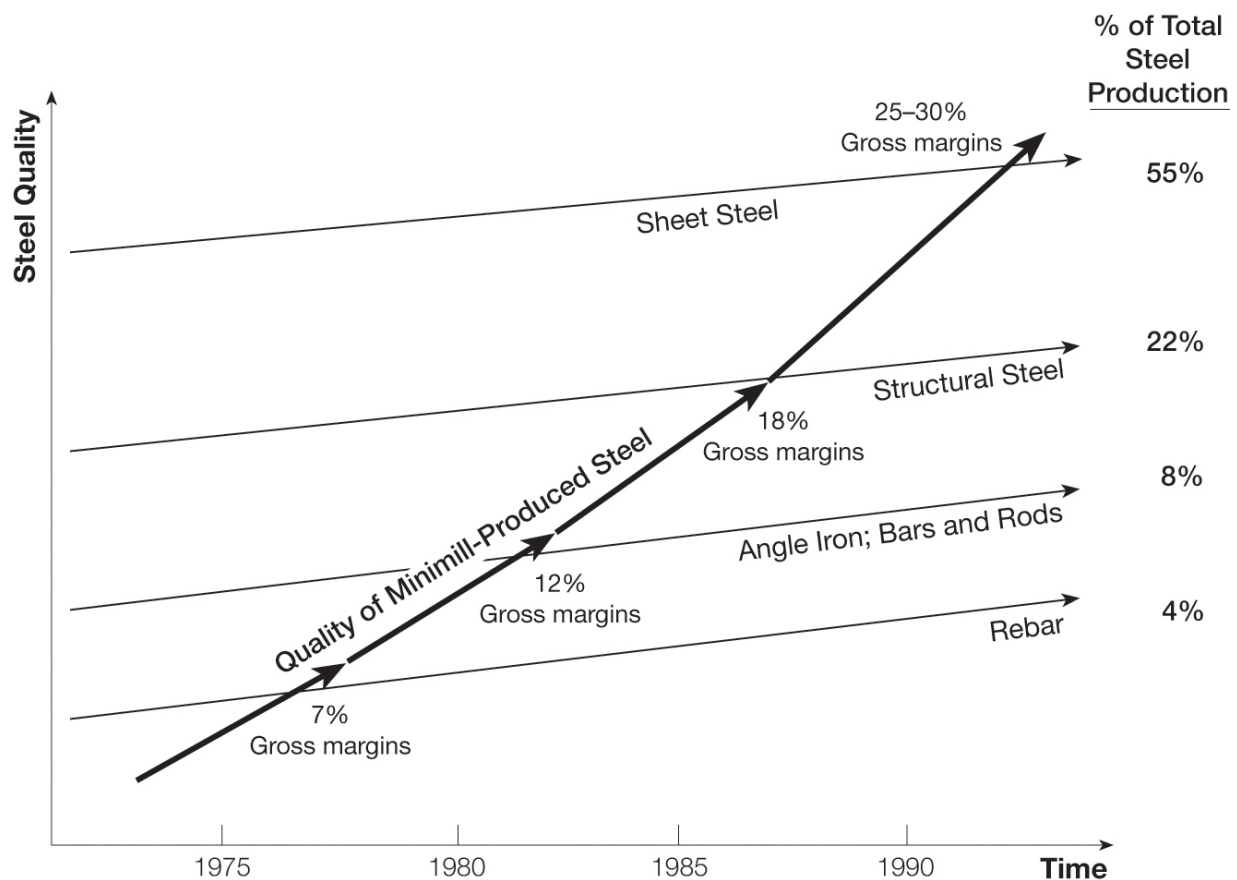
In contrast, with a 20 percent cost advantage, the minimills enjoyed attractive profits in competition against the integrated mills for rebar—until 1979, when the minimills finally succeeded in driving the last integrated mill out of the rebar market. Historical pricing statistics show that the price of rebar then collapsed by 20 percent. As long as the minimills could compete against higher-cost integrated mills, the game was profitable for them. But as soon as low-cost minimill was pitted against low-cost minimill in a commodity market, the reward for victory was that none of them could earn attractive profits in rebar.⁶ Worse, as they all sought profitability by becoming more efficient producers, they discovered that cost reductions meant survival, but not profitability, in a commodity such as rebar.⁷

Soon, however, the minimills looked up-market, and what they saw there spelled relief. If they could just figure out how to make bigger and better steel—shapes like angle iron and thicker bars and rods—they could roll *tons* of money, because in that tier of the market, as suggested in [figure 2-2](#), the integrated mills were earning gross margins of about 12 percent—nearly double the margins that they had been able to earn in rebar. That market was also twice as big as the rebar segment, accounting for about 8

percent of industry tonnage. As the minimills figured out how to make bigger and better steel and attacked that tier of the market, the integrated mills were almost relieved to be rid of the bar and rod business as well. It was a dog-eat-dog commodity compared with their higher-margin products, whereas for the minimills, it was an attractive opportunity compared with their lower-margin rebar. So as the minimills expanded their capacity to make angle iron and thicker bars and rods, the integrated mills shut their lines down or reconfigured them to make more profitable products. With a 20 percent cost advantage, the minimills enjoyed significant profits in competition against the integrated mills until 1984, when they finally succeeded in driving the last integrated mill out of the bar and rod market. Once again, the minimills reaped their reward: With low-cost minimill pitted against low-cost minimill, the price of bar and rod collapsed by 20 percent, and they could no longer earn attractive profits. What could they do?

FIGURE 2-2

The up-market migration of steel minimills



Source: American Iron and Steel Institute; interviews with company executives. Note that the tonnage percentages do not sum to 100 percent because there are other specialty categories of steel.

Continued up-market movement into structural beams appeared to be the next obvious answer. Gross margins in that sector were a whopping 18 percent, and the market was three times as large as the bar and rod business. Most industry technologists thought minimills would be unable to roll structural beams. Many of the properties required to meet the specifications for steel used in building and bridge construction were imparted to the steel in the rolling processes of big integrated mills, and you just couldn't get those properties in minimills' abbreviated facilities. What the technical experts didn't count on, however, was how desperately motivated the minimills would be to solve that problem, because it was the only way they could make attractive money. Minimills achieved

extraordinarily clever innovations as they stretched from angle iron to I-beams—things such as Chaparral Steel’s dog-bone mold in its continuous caster, which no one had imagined could be done. Although you could never have predicted what the technical solution would be, you *could* predict with perfect certainty that the minimills were powerfully motivated to figure it out. Necessity remains the mother of invention.

At the beginning of their invasion into structural beams, the biggest that the minimills could roll were little six-inch beams of the sort that undergird mobile homes. They attacked the low end of the structural beam market, and again the integrated mills were almost relieved to be rid of it. It was a dog-eat-dog commodity compared with their other higher-margin products where focused investment might bring more attractive volume. To the minimills, in contrast, it was an attractive product compared with the margins they were earning on rebar and angle iron. So as the minimills expanded their capacity to roll structural beams, the integrated mills shut their structural beam mills down in order to focus on more profitable sheet steel products. With a 20 percent cost advantage, the minimills enjoyed significant profits as long as they could compete against the integrated mills. Then in the mid-1990s, when they finally succeeded in driving the last integrated mill out of the structural beam market, pricing again collapsed. Once again, the reward for victory was the end of profit.

The sequence repeated itself when the leading minimill, Nucor, attacked the sheet steel business. Its market capitalization now dwarfs that of the largest integrated steel company, US Steel. Bethlehem Steel is bankrupt at the time of this writing.

This is not a history of bungled steel company management. It is a story of rational managers facing the innovator’s dilemma: Should we invest to protect the least profitable end of our business, so that we can retain our least loyal, most price-sensitive customers? Or should we invest to strengthen our position in the most profitable tiers of our business, with customers who reward us with premium prices for better products?

The executives who confront this dilemma come in all varieties: timid, feisty, analytical, and action-driven. In an unstructured world their actions might be unpredictable. But as large industry incumbents, they encounter powerful and predictable forces that motivate them to flee rather than fight when attacked from below. That is why shaping a business idea into a

disruption is an effective strategy for beating an established competitor. Disruption works because it is *much* easier to beat competitors when they are motivated to flee rather than fight.

The forces that propel well-managed companies up-market are *always* at work, in every company in every industry. Whether or not entrant firms have disrupted the established leaders yet, the forces are at work, leading predictably in one direction. It is not just a phenomenon of “technology companies” such as those involved in microelectronics, software, photonics, or biochemistry. Indeed, when we use the term *technology* in this book, it means the process that any company uses to convert inputs of labor, materials, capital, energy, and information into outputs of greater value. For the purpose of predictably creating growth, treating “high tech” as different from “low tech” is not the right way to categorize the world. Every company has technology, and each is subject to these fundamental forces.

The Role of Sustaining Innovation in Generating Growth

We must emphasize that we do *not* argue against the aggressive pursuit of sustaining innovation. Several other insightful books offer management techniques to help companies excel in sustaining innovations—and their contribution is important.⁸ Almost always a host of similar companies enters an industry in its early years, and getting ahead of that crowd—moving up the sustaining-innovation trajectory more decisively than the others—is critical to the successful *exploitation* of the disruptive opportunity. But this is the source of the dilemma: Sustaining innovations are so important and attractive, relative to disruptive ones, that the very best sustaining companies systematically ignore disruptive threats and opportunities until the game is over.

Sustaining innovation essentially entails making a better mousetrap. Starting a new company with a sustaining innovation isn’t necessarily a bad idea: Focused companies sometimes can develop new products more rapidly than larger firms because of the conflicts and distractions that broad scope often creates. The theory of disruption suggests, however, that once

they have developed and established the viability of their superior product, entrepreneurs who have entered on a sustaining trajectory should turn around and sell out to one of the industry leaders behind them. If executed successfully, getting ahead of the leaders on the sustaining curve and then selling out quickly can be a straightforward way to make an attractive financial return. This is common practice in the health care industry, and was the well-chronicled mechanism by which Cisco Systems “outsourced” (and financed with equity capital, rather than expense money) much of its sustaining-product development in the 1990s.

A sustaining-technology strategy is *not* a viable way to build new-growth businesses, however. If you create and attempt to sell a better product into an established market to capture established competitors’ best customers, the competitors will be motivated to fight rather than to flee.⁹ This advice holds even when the entrant is a huge corporation with ostensibly deeper pockets than the incumbent.

For example, electronic cash registers were a radical but sustaining innovation relative to electromechanical cash registers, whose market was dominated by National Cash Register (NCR). NCR *totally* missed the advent of the new technology in the 1970s—so badly, in fact, that NCR’s product sales literally went to zero. Electronic registers were so superior that there was no reason to buy an electromechanical product except as an antique. Yet NCR survived on service revenues for over a year, and when it finally introduced its own electronic cash register, its extensive sales organization quickly captured the same share of the market as the company had enjoyed in the electromechanical realm.¹⁰ The attempts that IBM and Kodak made in the 1970s and 1980s to beat Xerox in the high-speed photocopier business are another example. These companies were *far* bigger, and yet they failed to outmuscle Xerox in a sustaining-technology competition. The firm that beat Xerox was Canon—and that victory started with a disruptive tabletop copier strategy.

Similarly, corporate giants RCA, General Electric, and AT&T failed to outmuscle IBM on the sustaining-technology trajectory in mainframe computers. Despite the massive resources they threw at IBM, they couldn’t make a dent in IBM’s position. In the end, it was the disruptive personal computer makers, not the major corporations who picked a direct, sustaining-innovation fight, who bested IBM in computers. Airbus entered

the commercial airframe industry head-on against Boeing, but doing so required massive subsidies from European governments. In the future, the most profitable growth in the airframe industry will probably come from firms with disruptive strategies, such as Embraer and Bombardier's Canadair, whose regional jets are aggressively stretching up-market from below.¹¹

Disruption Is a *Relative* Term

An idea that is disruptive to one business may be sustaining to another. Given the stark odds that favor the incumbents in the sustaining race but entrants in disruptive ones, we recommend a strict rule: If your idea for a product or business appears disruptive to some established companies but might represent a *sustaining* improvement for others, then you should go back to the drawing board. You need to define an opportunity that is disruptive relative to *all* the established players in the targeted market, or you should not invest in the idea. If it is a sustaining innovation relative to the business model of a significant incumbent, you are picking a fight you are very unlikely to win.

Take the Internet, for example. Throughout the late 1990s, investors poured billions into Internet-based companies, convinced of their "disruptive" potential. An important reason why many of them failed was that the Internet was a sustaining innovation relative to the business models of a host of companies. Prior to the advent of the Internet, Dell Computer, for example, sold computers directly to customers by mail and over the telephone. This business was already a low-end disruptor, moving up its trajectory. Dell's banks of telephone salespeople had to be highly trained in order to walk their customers through the various configurations of components that were and were not feasible. They then manually entered the information into Dell's order fulfillment systems.

For Dell, the Internet was a sustaining technology. It made Dell's core business processes work better, and it helped Dell make more money in the way it was structured to make money. But the identical strategy of selling directly to customers over the Internet was very disruptive relative to

Compaq's business model, because that company's cost structure and business processes were targeted at in-store retail distribution.

The theory of disruption would conclude that if Dell (and Gateway) had not existed, then start-up Internet-based computer retailers might have succeeded in disrupting competitors such as Compaq. But because the Internet was sustaining to powerful incumbents, entrant Internet computer retailers have not prospered.

A Disruptive Business Model Is a Valuable Corporate Asset

A disruptive business model that can generate attractive profits at the discount prices required to win business at the low end is an extraordinarily valuable growth asset. When its executives carry the business model up-market to make higher-performance products that sell at higher price points, much of the increment in pricing falls to the bottom line—and it continues to fall there as long as the disruptor can keep moving up, competing at the margin against the higher-cost disruptee. When a company tries to take a higher-cost business model down-market to sell products at lower price points, almost none of the incremental revenue will fall to its bottom line. It gets absorbed into overheads. This is why, as we discuss in [chapter 7](#), established firms that hope to capture the growth created by disruption need to do so from within an autonomous business with a cost structure that offers as much headroom as possible for subsequent profitable migration up-market.

Moving up the trajectory into successively higher-margin tiers of the market and shedding less-profitable products at the low end is something that all good managers must do in order to keep their margins strong and their stock price healthy. Standing still is not an option, because firms that stop moving up find themselves in a rebarresque situation, slugging it out with hard-to-differentiate products against competitors whose costs are comparable.¹²

This ultimately means that in doing what they must do, every company prepares the way for its own disruption. This is the innovator's dilemma. But it also is the beginning of the innovator's solution. Disruption does not

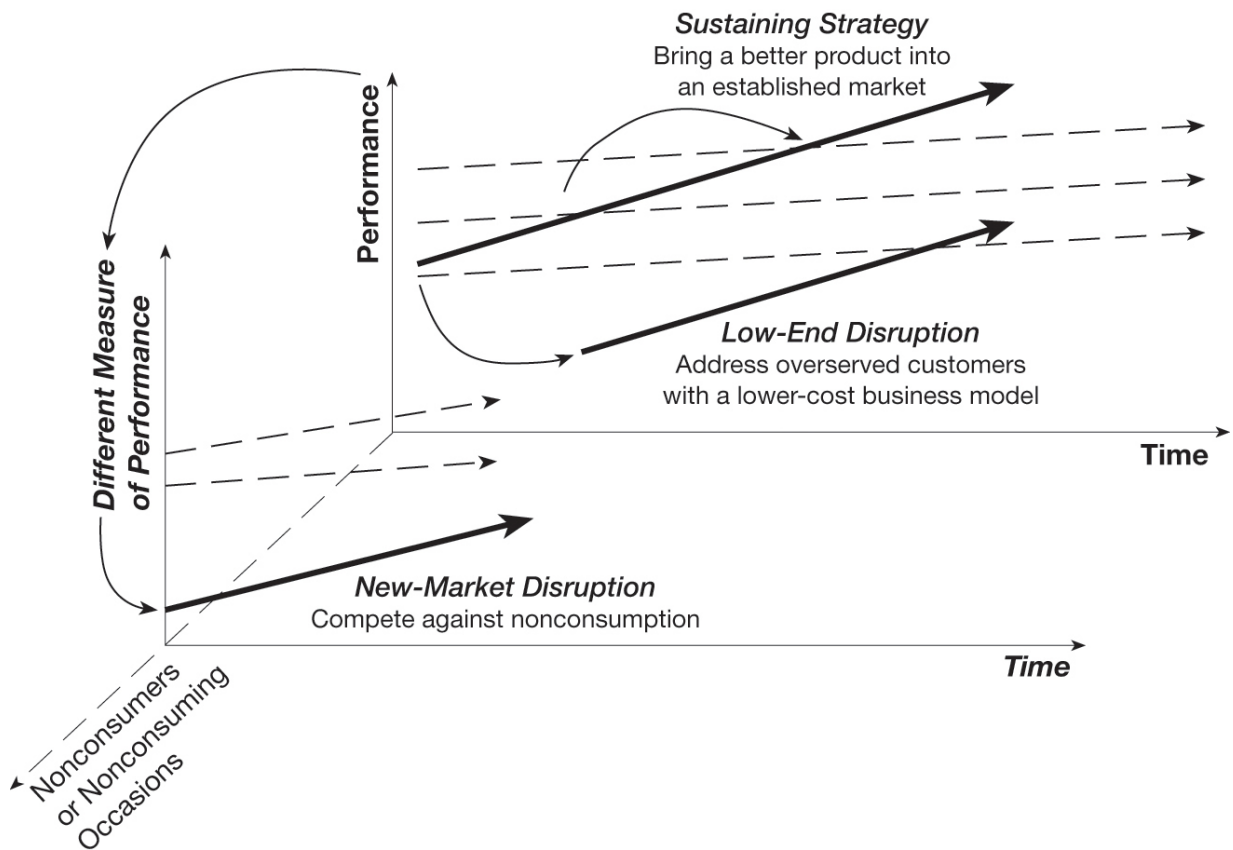
guarantee success, but it sure helps: *The Innovator's Dilemma* showed that following a strategy of disruption increased the odds of creating a successful growth business from 6 percent to 37 percent.¹³ Because the established company's course of action is mandated so clearly, it is also clear what executives who seek to create new-growth businesses should do: Target products and markets that the established companies are motivated to ignore or run away from. Many of the most profitable growth trajectories in history have been initiated by disruptive innovations.

Two Types of Disruption

For the sake of simplicity, *The Innovator's Dilemma* presented the disruptive innovation diagram in only two dimensions. In reality, there are two different types of disruptions, which can best be visualized by adding a third axis to the disruption diagram, as shown in [figure 2-3](#). The vertical and horizontal axes are as before: the performance of the product on the vertical axis, with time plotted on the horizontal dimension. The third axis represents new customers and new contexts for consumption.

FIGURE 2-3

The third dimension of the disruptive innovation model



Our original dimensions—time and performance—define a particular market application in which customers purchase and use a product or service. In geometric terms, this application and set of customers reside in a plane of competition and consumption, which *The Innovator's Dilemma* called a *value network*. A value network is the context within which a firm establishes a cost structure and operating processes and works with suppliers and channel partners in order to respond profitably to the common needs of a class of customers. Within a value network, each firm's competitive strategy, and particularly its cost structure and its choices of markets and customers to serve, determines its perceptions of the economic value of an innovation. These perceptions, in turn, shape the rewards and threats that firms expect to experience through disruptive versus sustaining innovations.¹⁴

The third dimension that extends toward us in the diagram represents new contexts of consumption and competition, which are new value networks. These constitute either new customers who previously lacked the money or skills to buy and use the product, or different situations in which a product can be used—enabled by improvements in simplicity, portability, and product cost. For each of these new value networks, a vertical axis can be drawn representing a product’s performance as it is defined in that context (which is a different measure from what is valued in the original value network).

Different value networks can emerge at differing distances from the original one along the third dimension of the disruption diagram. In the following discussion, we will refer to disruptions that create a new value network on the third axis as *new-market disruptions*. In contrast, *low-end disruptions* are those that attack the least-profitable and most overserved customers at the low end of the original value network.

New-Market Disruptions

We say that new-market disruptions compete with “nonconsumption” because new-market disruptive products are so much more affordable to own and simpler to use that they enable a whole new population of people to begin owning and using the product, and to do so in a more convenient setting. The personal computer and Sony’s first battery-powered transistor pocket radio were new-market disruptions, in that their initial customers were new consumers—they had not owned or used the prior generation of products and services. Canon’s desktop photocopiers were also a new-market disruption, in that they enabled people to begin conveniently making their own photocopies around the corner from their offices, rather than taking their originals to the corporate high-speed photocopy center where a technician had to run the job for them. When Canon made photocopying so convenient, people ended up making *a lot* more copies. Newmarket disruptors’ challenge is to create a new value network, where it is nonconsumption, not the incumbent, that must be overcome.

Although new-market disruptions initially compete against nonconsumption in their unique value network, as their performance improves they ultimately become good enough to pull customers out of the

original value network into the new one, starting with the least-demanding tier. The disruptive innovation doesn't invade the mainstream market; rather, it pulls customers out of the mainstream value network into the new one because these customers find it more convenient to use the new product.

Because new-market disruptions compete against nonconsumption, the incumbent leaders feel no pain and little threat until the disruption is in its final stages. In fact, when the disruptors begin pulling customers out of the low end of the original value network, it actually feels good to the leading firms, because as they move up-market in their own world, for a time they are replacing the low-margin revenues that disruptors steal, with higher-margin revenues from sustaining innovations.¹⁵

Low-End Disruptions

We call disruptions that take root at the low end of the original or mainstream value network *low-end* disruptions. Disruptions such as steel minimills, discount retailing, and the Korean automakers' entry into the North American market have been pure low-end disruptions in that they did not create new markets—they were simply low-cost business models that grew by picking off the least attractive of the established firms' customers. Although they are different, new-market and low-end disruptions both create the same vexing dilemma for incumbents. Newmarket disruptions induce incumbents to ignore the attackers, and low-end disruptions motivate the incumbents to flee the attack.

Low-end disruption has occurred several times in retailing.¹⁶ For example, full-service department stores had a business model that enabled them to turn inventories three times per year. They needed to earn 40 percent gross margins to make money within their cost structure. They therefore earned 40 percent three times each year, for a 120 percent annual return on capital invested in inventory (ROCII). In the 1960s, discount retailers such as Wal-Mart and Kmart attacked the low end of the department stores' market—nationally branded hard goods such as paint, hardware, kitchen utensils, toys, and sporting goods—that were so familiar in use that they could sell themselves. Customers in this tier of the market were overserved by department stores, in that they did not need well-

trained floor salespeople to help them get what they needed. The discounters' business model enabled them to make money at gross margins of about 23 percent, on average. Their stocking policies and operating processes enabled them to turn inventories more than five times annually, so that they also earned about 120 percent annual ROCII. The discounters did not accept lower levels of profitability—their business model simply earned acceptable profit through a different formula.¹⁷

It is very hard for established firms *not* to flee from a low-end disruptor. Consider, for example, the choice that executives of full-service department stores had to make when the discount retailers were attacking the branded hard goods at the low end of department stores' merchandise mix. Retailers' critical resource allocation decision is the use of floor or shelf space. One option for department store executives was to allocate more space to even higher-margin cosmetics and high-fashion apparel, where gross margins often exceeded 50 percent. Because their business model turned inventories three times annually, this option promised 150 percent ROCII.

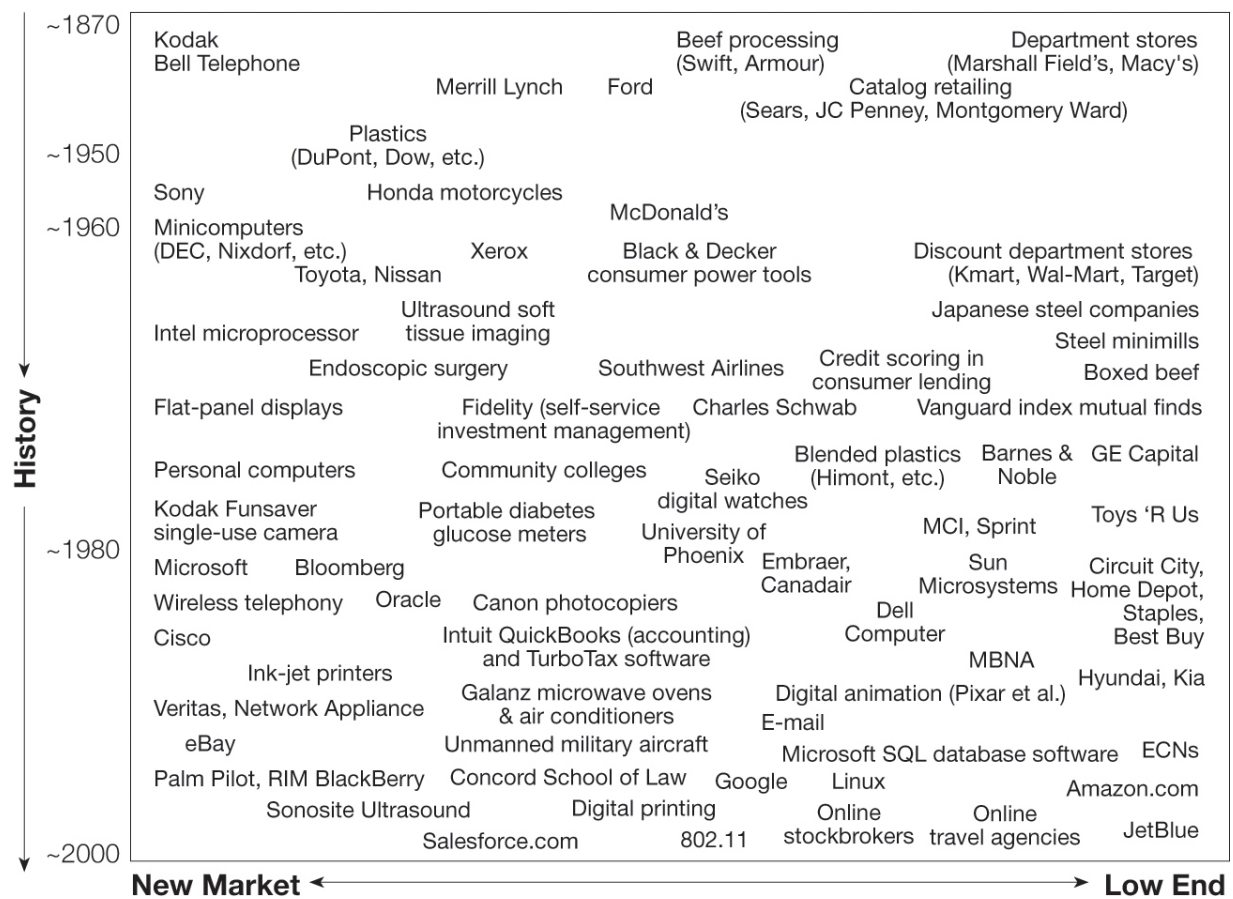
The alternative was to defend the branded hard goods businesses, which the discounters were attacking with prices 20 percent below those of department stores. Competing against the discounters at those levels would send margins plummeting to 20 percent, which, given the three-times inventory turns that were on average inherent in their business model, entailed a ROCII of 60 percent. It thus made perfect sense for the full-service department stores to flee—to get out of the very tiers of the market that the discounters were motivated to enter.¹⁸

Many disruptions are hybrids, combining new-market and low-end approaches, as depicted by the continuum of the third axis in [figure 2-3](#). Southwest Airlines is actually a hybrid disruptor, for example. It initially targeted customers who weren't flying—people who previously had used cars and buses. But Southwest pulled customers out of the low end of the major airlines' value network as well. Charles Schwab is a hybrid disruptor. It stole some customers from full-service brokers with its discounted trading fees, but it also created new markets by enabling people who historically were not equity investors—such as students—to begin owning and trading stocks.¹⁹

[Figure 2-4](#) shows where some of history's more successful disruptors were positioned along the continuum of new-market to low-end disruption at their inception. The appendix to this chapter offers a brief historical explanation of each of the disruptive products or companies listed on the chart. This is not a complete census of disruptive companies, of course, and their position on the chart is only approximate. However, the array does convey our sense that disruption is a primary wellspring of growth. The prevalence of Japanese companies such as Sony, Nippon Steel, Toyota, Honda, and Canon in the period between 1960 and 1980 and the absence of disruptive Japanese companies in the 1990s, for example, explain a lot about why Japan's economy has stagnated. Many of its most influential companies grew dramatically by disrupting others; but the structure of Japan's economic system inhibits the creation of new waves of disruptive growth, in part because they might threaten those companies today.^{[20](#)}

FIGURE 2-4

Examples of companies and products whose roots were in disruption



The chart also shows that disruption is an ongoing force that is always at work—meaning that disruptors in one generation become disruptees later. The Ford Model T, for example, created the first massive wave of disruptive growth in automobiles. Toyota, Nissan, and Honda then created the next wave, and Korean automakers Hyundai and Kia have now begun the third. AT&T's wireline long distance business, which disrupted Western Union, is being disrupted by wireless long distance. Plastics makers such as Dow, DuPont, and General Electric continue to disrupt steel, even as their low end is being eaten away by suppliers of blended polyolefin plastics such as Himont.

Shaping Ideas to Become Disruptive: Three Litmus Tests

At the beginning of this chapter, we mentioned that few technologies or product ideas are inherently sustaining or disruptive when they emerge from the innovator's mind. Instead, they go through a process of becoming fleshed out and shaped into a strategic plan in order to win funding. Many—but not all—of the initial ideas that get shaped into sustaining innovations could just as readily be shaped into disruptive business plans with far greater growth potential. The shaping process must be consciously managed, however, and not left to the dispersed and instinctive decisions of those who write business plans.

Executives must answer three sets of questions to determine whether an idea has disruptive potential. The first set explores whether the idea can become a new-market disruption. For this to happen, at least one and generally both of two questions must be answered affirmatively:

- Is there a large population of people who historically have not had the money, equipment, or skill to do this thing for themselves, and as a result have gone without it altogether or have needed to pay someone with more expertise to do it for them?
- To use the product or service, do customers need to go to an inconvenient, centralized location?

If the technology can be developed so that a large population of less skilled or less affluent people can begin owning and using, in a more convenient context, something that historically was available only to more skilled or more affluent people in a centralized, inconvenient location, then there is potential for shaping the idea into a new-market disruption.

The second set of questions explores the potential for a low-end disruption. This is possible if these two questions can be answered affirmatively:

- Are there customers at the low end of the market who would be happy to purchase a product with less (but good enough)

performance if they could get it at a lower price?

- Can we create a business model that enables us to earn attractive profits at the discount prices required to win the business of these overserved customers at the low end?

Often, the innovations that enable low-end disruption are improvements that reduce overhead costs, enabling a company to earn attractive returns on lower gross margins, coupled with improvements in manufacturing or business processes that turn assets faster.

Once an innovation passes the new-market or low-end test, there is still a third critical question, or litmus test, to answer affirmatively:

- Is the innovation disruptive to *all* of the significant incumbent firms in the industry? If it appears to be sustaining to one or more significant players in the industry, then the odds will be stacked in that firm's favor, and the entrant is unlikely to win.

If an idea fails the litmus tests, then it cannot be shaped into a disruption. It may have promise as a sustaining technology, but in that case we would expect that it could not constitute the basis of a new-growth business for an entrant company.

TABLE 2-1

Three approaches to creating new-growth businesses

Dimension	Sustaining innovations	Low-end disruptions	New-market disruptions
Targeted performance of the product or service	Performance improvement <i>in attributes most valued by the industry's most demanding customers</i> . These improvements may be incremental or breakthrough in character.	Performance that is good enough along the traditional metrics of performance at the low end of the mainstream market.	Lower performance in "traditional" attributes, but <i>improved performance in new attributes—typically simplicity and convenience</i> .

Dimension	Sustaining innovations	Low-end disruptions	New-market disruptions
Targeted customers or market application	The <i>most attractive (i.e., Overserved customers in the low end of the mainstream markets who are willing to pay for improved performance.</i>	mainstream market.	Targets <i>non-consumption</i> : customers who historically lacked the money or skill to buy and use the product.
Impact on the required business model (processes and cost structure)	Improves or maintains profit margins by exploiting the <i>existing processes and cost structure</i> and making better use of current competitive advantages.	Utilizes a <i>new operating or financial approach or both</i> —a different combination of lower gross profit margins and higher asset utilization that can earn attractive returns at the discount prices required to win business at the low end of the market.	Business model must make money at lower price per unit sold, and at unit production volumes that initially will be small. Gross margin dollars per unit sold will be significantly lower.

For summary, [table 2-1](#) summarizes and contrasts the characteristics of the three strategies that firms might pursue in creating new-growth businesses: sustaining innovations, low-end disruptions, and new-market disruptions. It compares the targeted product performance or features, the targeted customers or markets, and the business model implications that each route entails. We hope that managers can use this as a template so that they can categorize and see the implications of different plans that might be presented to them for approval.

Executives can use this categorization and the litmus tests to foresee the competitive consequences of alternative strategies as they shape an idea. To illustrate, we'll examine three questions: whether Xerox could disrupt Hewlett-Packard's ink-jet printing business, how to create growth in air conditioning, and whether online banking had (or has) the potential to create a disruptive new-growth business.

Could Xerox Disrupt Hewlett-Packard?

We don't actually know if Xerox has considered the possibility of creating a new business of the sort we will examine here, and we use the companies' names only to make the example more vivid. We've based this scenario

solely on information from public sources. Xerox reportedly has developed outstanding ink-jet printing technology. What can it do with it? It could attempt to leapfrog Hewlett-Packard by making the best ink-jet printer on the market. Even if it could make a better printer, however, Xerox would be fighting a battle of sustaining technology against a company with superior resources and more at stake. HP would win that fight. But could Xerox craft a disruptive strategy for this technology? We'll test the conditions for a low-end strategy first.

To determine whether this strategy is viable, Xerox's managers should test whether customers in the lowest market tiers might be willing to buy a "good enough" printer that is cheaper than prevailing products.²¹ At the highest tier of the market, customers seem willing to pay significantly more for a faster printer that produces sharper images. However, consumers in the less-demanding tiers are becoming increasingly indifferent to improvements. It is likely they would be interested in lower-cost alternatives. So the first question gets an affirmative answer.

The next question is whether Xerox could define a business model that could generate attractive returns at the discounted prices required to win business at the low end. The possibilities here don't look good. HP and other printer companies already outsource the fabrication and assembly of components to the lowest-cost sources in the world. HP makes its money selling ink cartridges—whose fabrication also is outsourced to low-cost suppliers. Xerox could enter the market by selling ink cartridges at lower prices, but unless it could define an overhead cost structure and business processes that would allow it to turn assets faster, Xerox could not sustain a product strategy of low-end disruption.²²

This means we'll need to evaluate the potential for a new-market disruption—competing against nonconsumption. Is there a large, untapped population of computer owners who don't have the money or skill to buy and use a printer? Probably not. Hewlett-Packard already competed successfully against nonconsumption when it launched its easy-to-use, inexpensive ink-jet printers.

What about enticing existing printer owners to buy more printers, by enabling consumption in a new, more convenient context? Now, this might be achievable. Documents created on notebook computers are not easy to print. Notebook users have to find a stationary printer and connect

to it either over a network or a printer cable, or they must transfer the file via removable media to a computer that is connected to a printer. If Xerox incorporated a lightweight, inexpensive printer into the base or spine of a notebook computer so that people on the go could get hard copies when and where they needed them, the company could probably win customers even if the printer wasn't as good as a stationary ink-jet printer. Only Xerox's engineers could determine whether the idea is technologically feasible. But as a strategy, this would pass the litmus tests.²³

If Xerox attempted this, we would expect HP to ignore this new-market disruption at the outset because the market would be much smaller than the stationary printer market. HP's printer business is huge, and the company needs large sources of new revenue to sustain its growth. To trap Hewlett-Packard in an innovator's dilemma, Xerox should develop a business model that's attractive to Xerox but unattractive to the managers of HP and other leading established printer companies. This might entail pricing ink cartridges for embedded notebook printers low enough that the executives of HP's ink jet printer business would find the market unattractive relative to investments they might make to move up-market in search of the higher profits they could find by competing against higher-cost stationary laser printers.

Conditions for Growth in Air Conditioners

The window-mounted air conditioner market is widely known to be mature, dominated by giants such as Carrier and Whirlpool. Could a company like Hitachi wallop them? We would predict defeat if Hitachi tried to enter this market with a quieter product that offered more features and better energy efficiency.²⁴ Is a low-end disruption viable? Our sense is that there are overserved customers at the low end of the existing market. They signal their overservedness by opting for the least-expensive models they can find, unwilling to pay premium prices for the alternative products that are available to them. Hitachi might expand its already substantial manufacturing operations in China, making air conditioners for export to developed economies. This might bring modest but temporary success, because after the established companies respond by setting up their own manufacturing operations in China, Hitachi would find itself locked in a

battle with competitors whose costs are comparable and whose distribution and service infrastructure are strong, and where the targeted customers already have manifested an unwillingness to pay premium prices for better products. Employing low-cost labor constitutes a low-cost business model only until competitors avail themselves of the same option.

How about a new-market disruption, however? There are hundreds of millions of nonconsumers of residential air conditioning in China, who have been blocked from that market because the power-hungry, expensive machines that historically have been available don't fit in the average family's pocketbook or apartment. If Hitachi could design a \$49.95 product that would easily slip into the window of a cramped Shanghai apartment and reduce the temperature and humidity in a ten-foot by ten-foot room with ten amps of current, things might get interesting—because once Hitachi had a business model that could make money at that price point, taking on the rest of the up-market world would be easy. Parenthetically, while Western executives are understandably concerned about the threat that low-cost manufacturing in China poses to them, our guess is that China's greatest competitive asset is the unfathomable amount of nonconsumption in its markets, which makes them fertile ground for new-market disruptive companies of many sorts.

The Potential for Internet Banking

When we ask the test questions about Internet banking, we conclude that disruption using this technology is not possible. In the first place, there is not a large population of people who have been unable to open and maintain a bank account because they have lacked the money or skill. Existing banks' penetration of this market is high. This rules out a new-market disruption for Internet banking.

Second, are there current bank customers at the low end who would be happy to accept a bank account with fewer privileges and features in order to get the service at a lower price? The prevalence of advertisements featuring no-fee accounts is a testament that such customers exist. But is it possible to design a business model that would afford a disruptive online bank attractive profits at the discount prices required to win business at the low end? This is problematic. The cost of money is similar for all banks.

E*Trade Bank and Sony Bank are seeking answers to the low-cost business model question.

Because the idea likely does not satisfy the conditions for either a new-market or a low-end disruption, Internet banking is likely to be implemented as a sustaining innovation by established banks. As for the third test, there already are many banks and credit unions, with only a limited number of office locations, that transact much of their business by mail. Internet banking would have a sustaining impact on their business models.

Disruption is a theory: a conceptual model of cause and effect that makes it possible to better predict the outcomes of competitive battles in different circumstances. The asymmetries of motivation chronicled in this chapter are natural economic forces that act on all businesspeople, all the time. Historically, these forces almost always have toppled the industry leaders when an attacker has harnessed them, because disruptive strategies are predicated upon competitors doing what is in their best and most urgent interest: satisfying their most important customers and investing where profits are most attractive. In a profit-seeking world, this is a pretty good bet.

Not all innovative ideas can be shaped into disruptive strategies, however, because the necessary preconditions do not exist; in such situations, the opportunity is best licensed or left to the firms that are already established in the market. On occasion, entrant companies have simply caught the leaders asleep at the switch and have succeeded with a strategy of sustaining innovation. But this is rare. Disruption does not guarantee success: It just helps with an important element in the total formula. Those who create new-growth businesses need to get on the right side of a number of other challenges, to which we will now turn.

Appendix: A Brief Description of the Disruptive Strategies of the Firms in [Figure 2-4](#)

[Table 2-2](#) briefly summarizes our understanding of the disruptive roots of the success of the companies that are arrayed in [figure 2-4](#). Because of space limitations, much important detail has been omitted. The companies are listed in alphabetical, rather than chronological, order. We do not pretend to be strong business historians, and as a consequence can only present here a partial listing of disruptive companies. Furthermore, it is often difficult to identify a specific year in which each firm's disruptive strategy was launched. Some firms existed for a considerable period, often

in other lines of business, before the disruptive strategy that led to their ultimate success was implemented. In some cases it seems easier to visualize the disruption in terms of a product category, rather than by listing the name of one company. Hence, we ask our readers to regard this information as only suggestive, rather than definitive.

TABLE 2-2

Disruptive strategies and companies

Company or product	Description
802.11	This is a protocol for high-bandwidth wireless transfer of data. It has begun disrupting local-area wireline networks. Its present limitations are that the signals can't travel long distances.
Amazon.com	A low-end disruption relative to traditional bookstores.
Barnes & Noble	Began as a local seller of mostly overstocked, surplus books. Evolved to become the dominant discount retailer of in-print books.
Beef processing	In the 1880s, Swift and Armour began huge, centralized beef slaughtering operations that transported large sides of beef by refrigerated railcar to local meat cutters. This disrupted local slaughtering operations.
Bell Telephone	Bell's original telephone could only carry a signal for three miles and therefore was rejected by Western Union, whose business was long-distance telegraphy, because Western Union couldn't use it. Bell started a new-market disruption, offering local communication, and as the technology improved, it pulled customers from telegraphy's long-distance value network into telephony.
Black & Decker	Prior to 1960, handheld electric tools were heavy and rugged, designed for professionals—and very expensive. B&D introduced a line of plastic-encased tools with universal motors that would only last twenty-five to thirty hours of operation—which actually was more than adequate for most do-it-yourselfers who drill a few holes per month. In today's dollars, B&D brought the cost of these tools down from \$150 to \$20, enabling a whole new population to own and use their own tools.
Blended plastics	These blends of inexpensive polyolefin plastics such as polypropylene, sold by firms such as Himont, create composite materials that in many ways share the best properties of their constituent materials. They are getting better at a stunning rate, disrupting markets that historically had been the province of engineering plastics made by firms such as GE Plastics.

Company or product	Description
Bloomberg L.P.	Bloomberg began by providing basic financial data to investment analysts and brokers. It has gradually improved its data offerings and analysis and subsequently moved into the financial news business. It has substantially disrupted Dow Jones and Reuters as a result. More recently it has created its own electronic clearing network to disrupt stock exchanges. Issuers of government securities can auction their initial offerings over the Bloomberg system, disrupting investment banks.
Boxed beef	The “boxed beef” model of Iowa Beef Packers completed the disruption of local butchering operations. Instead of shipping large sides of beef to local meat cutters for further cutting, IBP cut the beef into finished or nearly finished cuts for placement directly in supermarket cases.
Canon photocopiers	Until the early 1980s, when people needed photocopies, they had to take their originals to the corporate photocopy center, where a technician ran the job for them. He <i>had</i> to be a technician, because the high-speed Xerox machine there was very complicated and needed servicing frequently. When Canon and Ricoh introduced their countertop photocopiers, they were slow, produced poor-resolution copies, and didn’t enlarge or reduce or collate. But they were so inexpensive and simple to use that people could afford to put one right around the corner from their office. At the beginning people still took their high-volume jobs to the copy center. But little by little Canon improved its machines to the point that immediate, convenient access to high-quality, full-featured copying is almost a constitutional right in most workplaces today.
Catalog retailing	Sears, Roebuck and Montgomery Ward took root as catalog retailers—enabling people in rural America to buy things that historically had not been accessible. Their business model, entailing annual inventory turns of four times and gross margins of 30 percent, was disruptive relative to the model of full-service department stores, which required 40 percent gross margins because they turned inventories only three times annually. Sears and Montgomery Ward later moved up-market, building retail stores.
Charles Schwab	Started in 1975 as one of the first discount brokers. In the late 1990s Schwab created a separate organization to build an online trading business. It was so successful that the company folded its original organization into the disruptive one.
Circuit City, Best Buy	Disrupted the consumer electronics departments of full-service and discount department stores, which has sent them up-market into higher-margin clothing.
Cisco	Cisco’s router uses packet-switching technology to direct the flow of information over the telecommunications system, rather than the circuit-switching technology of the established industry leaders such as Lucent, Siemens, and Nortel. The technology divides information into virtual “envelopes” called packets and sends them out over the Internet. Each

Company or product	Description
	packet might take a different route to the addressed destination; when they arrive, the packets are put in the right order and “opened” for the recipient to see. Because this process entailed a few seconds’ latency delay, packet switching could not be used for voice telecommunications. But it was good enough to enable a new market to emerge—data networks. The technology has improved to the point that today, the latency delay of a packet-switched voice call is almost imperceptibly slower than that of a circuit-switched call, enabling VOIP, or voice-over-Internet-protocol telephony.
Community colleges	In some states, up to 80 percent of the graduates of reputable four-year state universities take some or all of their required general education courses at much less expensive community colleges, and then transfer those credits to the university—which (unconsciously) is becoming a provider of upper-division courses. Some community colleges have begun offering four-year degrees. Their enrollment is booming, often with nontraditional students who otherwise would not have taken these courses.
Concord School of Law	Founded by Kaplan, a unit of the Washington Post Company, this online law school has attracted a host of (primarily) nontraditional students. The school’s accreditation allows its graduates to take the California Bar exam, and its graduates’ success rate is comparable to those of many other law schools. Many of its students don’t enroll to become lawyers, however. They want to understand law to help them succeed in other careers.
Credit scoring	A formulaic method of determining creditworthiness, substituting for the subjective judgments of bank loan officers. Developed by a Minneapolis firm, Fair Isaac. Used initially to extend Sears and Penney’s in-store credit cards. As the technology improved, it was used for general credit cards, and then auto, mortgage, and now small-business loans.
Dell Computer	Dell’s direct-to-customer retailing model and its fast-throughput, high asset-turns manufacturing model allowed it to come underneath Compaq, IBM, and Hewlett-Packard as a low-end disruptor in personal computers. Clayton Christensen, the quintessential low-end consumer, wrote his doctoral thesis on a Dell notebook computer purchased in 1991 because it was the cheapest portable computer on the market. Because of Dell’s reputation for marginal quality, students needed special permission from Harvard to use doctoral stipend money to buy a Dell rather than a computer with a more reputable brand. Today Dell supplies most of the Harvard Business School’s computers.
Department stores	Department stores such as Z.C.M.I. in Salt Lake City, Marshall Field’s in Chicago, and Macy’s in New York disrupted small shopkeepers. The department stores made money by accelerating inventory turns to three times per year, which enabled them to earn attractive profit with 40

Company or product	Description
	percent gross margins. Because their salespeople were much less knowledgeable about products, at the outset department stores had to start at the simplest end of the merchandise mix, with products that were so familiar in use that they sold themselves.
Digital animation	The fixed cost and skill required to make a full-length animated movie historically was so high that almost nobody could do it except Disney. Digital animation technology now enables far more companies (such as Pixar) to compete against Disney.
Digital printing	Offset printing is being disrupted by the ability of local ink- and laser-jet printers to print custom, on-demand color documents at ever-improving speeds and quality. It has initially taken root in applications such as sales brochures.
Discount department stores	Department stores such as Korvette's in New York, and later Kmart, Wal-Mart, and Target, disrupted full-service department stores. The discount stores made money by accelerating inventory turns to five times per year, which enabled them to earn attractive profit with 23 percent gross margins. Because their salespeople were much less knowledgeable about products, at the outset the discount department stores had to start at the simplest end of the merchandise mix, with branded hard goods that were so familiar in use that they sold themselves. They subsequently have moved up-market into soft goods such as clothing.
eBay	Most of the Internet start-ups of the late 1990s attempted to use the Internet as a sustaining innovation relative to the business models of established companies. eBay was a notable exception because it pursued a new-market disruptive strategy—enabling owners of collectibles that could never turn the heads of auction house executives to sell off things that they no longer needed.
ECNs	Electronic clearing networks (ECNs) allow buyers and sellers of equities to exchange them over a computer, at a fraction of the cost of doing it on a formal stock exchange. Island, one of the leading ECNs, can handle on one workstation volume amounting to 20 percent of the NASDAQ's volume.
E-mail	E-mail is disrupting postal services. The volume of personal communication that is done by letter is dropping precipitously, leaving postal services with magazines, bills, and junk mail.
Embraer and Canadair regional jets	The regional passenger jet business is booming, as the capacity of their jets over the past fifteen years has stretched from 30 to 50, 70, and now 106. As Boeing and Airbus struggle to make bigger, faster jets for transcontinental and transoceanic travel, their growth has stagnated; the industry has consolidated (Lockheed and McDonnell Douglas have been folded in); and the growth is at the bottom of the market.

Company or product	Description
Endoscopic surgery	Minimally invasive surgery was actively disregarded by leading surgeons because the technique could only address the simplest procedures. But it has improved to the point that even certain relatively complicated heart procedures are done through a small port. The disruptive impact has primarily been on equipment makers and hospitals.
Fidelity Management	Created “self-service” personal financial management through its easy-to-buy families of mutual funds, 401k accounts, insurance products, and so forth. Fidelity was founded a few years after World War II, but began its disruptive movements in the 1970s, as best we can tell.
Flat-panel displays (Sharp et al.)	We normally think of disruptive technologies as being inexpensive, and many people are puzzled at how we could call flat-panel displays disruptive. Haven’t they come from the high end? Actually, no. Flat-panel LCD displays took root in digital watches and then moved to calculators, notebook computers, and small portable televisions. These were applications that historically had no electronic displays at all, and LCD displays were <i>much</i> cheaper than alternative means of bringing imaging to those applications. Flat screens have now begun invading the mainstream market of computer monitors and in-home television screens, disrupting the cathode ray tube. They are able to sustain substantial premium prices because of their two-dimensional character.
Ford	Henry Ford’s Model T was so inexpensive that he enabled a much larger population of people who historically could not afford cars to own one.
Galanz	China’s Galanz captured nearly 40 percent of the world microwave oven market in the 1990s. Although the company could have followed a strategy of low-end disruption—using low-cost Chinese labor to make appliances for export—it instead chose to be a new-market disruptor, making ovens that were small enough and consumed little-enough power to be used in cramped Chinese apartments and were cheap enough for non-microwave-oven owners to afford. Once they had built a business model that could make profits at market-enabling price points for the domestic Chinese market, taking on the rest of the world was as easy as egg-drop soup.
GE Capital	Has disrupted major portions of the commercial banks’ historical markets, primarily through low-end disruptive strategies.
Google	Google and its competing Internet search engines are disrupting directories of many sorts, including the Yellow Pages.
Honda motorcycles	Honda’s Supercub, introduced in the late 1950s, disrupted makers of big, thunderous motorcycles such as Harley-Davidson, Triumph, BMW, and others. It took root as an off-road recreational motorized bicycle, and then improved. Honda was joined by Yamaha, Kawasaki, and Suzuki.

Company or product	Description
Ink-jet printers	These were a disruption to the laser jet printer and a sustaining technology relative to the dot-matrix printer. We put ink-jet printers toward the “new-market” end of the disruption spectrum because their compact size, light weight, and low initial cost enabled a whole new population of computer owners—primarily students—to individually own and use a printer. Although they were slow and produced fuzzy images at the outset, ink-jet printers are now the mainstream printer of choice, having pushed laser jets to the high end. Hewlett-Packard stayed atop this industry by setting up an autonomous inkjet business unit to compete against its laser jet printer business.
Intel microprocessor	Intel’s earliest microprocessor in 1971 could only constitute the brain of a four-function calculator. Makers of computers whose logic circuitry is based on microprocessors have disrupted firms that made mainframes and minicomputers, whose logic circuitry was based on printed wiring boards.
Intuit’s QuickBooks accounting software	Whereas the established industry leaders in accounting software enabled small-business managers to run all sorts of sophisticated reports for analytical purposes, QuickBooks, which was a derivative of Intuit’s personal finance software product Quicken, basically helped them keep track of their cash. It created a huge new market among very small business owners (most with fewer than five employees) who historically did not keep their books on computer. Within two years of launch, Intuit had seized 85 percent of the small-business accounting software market —mainly by creating new growth. The stealing of the established companies’ customers came later, as QuickBooks’ functionality improved.
Intuit’s TurboTax	PC-based accounting software is disrupting personal tax preparation services such as H&R Block.
Japanese steel makers	Firms such as Nippon Steel, Nippon Kokkan, and Kobe and Kawasaki Steel began their growth by exporting very low quality steel to Western markets starting in the late 1950s. As their customers (including disruptive Japanese automakers like Toyota) grew, the Japanese steel industry had to increase capacity dramatically, enabling it to incorporate the latest steelmaking technology such as continuous casting and basic oxygen furnaces in the new mills. This accelerated their up-market trajectory dramatically.
JetBlue	Whereas Southwest Airlines initially followed a strategy of new-market disruption, JetBlue’s approach is low-end disruption. Its long-range viability depends on the major airlines’ motivation to run away from the attack, as integrated steel mills and full-service department stores did.
Kodak	Until the late 1800s, photography was extremely complicated. Only professionals could own and operate the expensive equipment. George

Company or product	Description
	Eastman's simple "point and shoot" Brownie camera allowed consumers to take their own pictures. They could then mail the roll of film to Kodak, which would develop it and return the photos by mail.
Kodak Funsaver	Kodak's Funsaver brand single-use camera was born after painful labor within Kodak, because its profit model and gross margins were lower than Kodak could earn by selling roll film, and the quality of the images was not as good as those taken in high-quality 35mm cameras. But Kodak commercialized it through a different division, and it sold almost exclusively to people who would not have bought film anyway because they didn't have a camera. Although it has potential to move up-market and take share against traditional cameras with a new brand, Maxx, we worry that Kodak might have stopped driving it in this direction.
Korean auto manufacturers (Hyundai and Kia)	Korean automakers, including Hyundai and Kia, gained more points of world-wide market share in the 1990s than any other country's automakers. And yet few of the established firms are concerned, because their gains have come in what is, to the established firms, the lowest-profit portion of the market.
Linux	The disruptiveness of the Linux operating system can only be expressed relative to the alternatives now in the market. Its most successful deployment thus far is within the market for server operating systems—sandwiched between high-end UNIX systems and the Microsoft Windows NT operating system (which has been moving disruptively up-market against UNIX for some time). From its initial foothold in Internet servers, it has gained significant share against UNIX operating systems such as Sun's Solaris. The position of Linux may actually block the further up-market movement of Microsoft NT. Linux has begun to disrupt the market for operating system software on handheld devices as well.
MBNA	We noted earlier that credit scoring is a formulaic method of determining the creditworthiness of a loan applicant. It was originally implemented in commercial banks as a sustaining technology, to reduce the costs of credit evaluation. In the 1990s, however, it was deployed in high-volume, low-cost "monoline" business models by firms such as MBNA, Capital One, and First USA, which have substantially disrupted commercial banks' credit card business. At the time of this writing, in fact, Citibank is the only remaining major commercial bank with a substantial and profitable credit card business.
McDonald's	The fast food industry has been a hybrid disruptor, making it so inexpensive and convenient to eat out that they created a massive wave of growth in the "eating out" industry. Their earliest victims were mom-and-pop diners. In the last decade the advent of food courts has taken fast food up-market. Expensive, romantic restaurants still thrive at the high end, of course.

Company or product	Description
MCI, Sprint	These firms were low-end disruptors relative to AT&T's long-distance telephone business. They enjoyed a unique opportunity to do this, because AT&T's long-distance rates were set by regulation at artificially high levels in order to subsidize local residential telephone service.
Merrill Lynch	Charles Merrill's mantra in 1912 was to "Bring Wall Street to Main Street." By employing salaried rather than commissioned brokers, he made it inexpensive enough to trade stocks that middle-income Americans could become equity investors. Merrill Lynch moved up-market over the next 90 years toward investors of higher net worth. Most of the brokerage firms that held seats on the New York Stock Exchange in the 1950s and 1960s have been merged out of existence because Merrill Lynch disrupted them.
Microsoft	Its operating system was inadequate versus those of mainframe and minicomputer makers, versus UNIX, and versus Apple's system. But its migration from DOS to Windows to Windows NT is taking the firm up-market, to the point that the UNIX world is seriously threatened. Microsoft, in turn, faces a threat from Linux. See also SQL.
Minicomputers	Companies such as Digital Equipment, Prime, Wang, Data General, and Nixdorf were new-market disruptors relative to mainframe computer makers. Their relative simplicity and low price enabled departments (particularly engineering) in organizations to have their own computers, instead of having to rely on inconvenient, centralized mainframe computers that typically were optimized for generating financial reports.
Online stock-brokers	Online trading of equities is a sustaining technology relative to the business models of discount brokers such as Ameritrade and is disruptive relative to full-service brokers such as Merrill Lynch. For Schwab, which started as a bare-bones discount broker but had moved up toward the mainstream market by the mid-1990s, Internet-based trading was disruptive enough that the company had to set up a separate division.
Online travel agencies	Enabled by electronic ticketing, online travel agencies such as Expedia and Travelocity have so badly disrupted full-service, bricks-and-mortar agencies such as American Express that many airlines have dramatically cut the substantial commissions that historically they had paid to travel agencies.
Oracle	Oracle's relational database software was disruptive relative to that of the prior leaders, Cullinet and IBM, whose hierarchical or transactional database software ran on mainframe computers and was used to generate standard financial reports. Relational databases ran on minicomputers (and then microprocessor-based computers). Users without deep programming expertise could readily create their own

Company or product	Description
	custom reports and analyses using Oracle's modular, relational architecture.
Palm Pilot, RIM BlackBerry	Handheld devices are new-market disruptions relative to notebook computers.
Personal computers	Microprocessor-based computers made by firms such as Apple, IBM, and Compaq were true new-market disruptions in that for years they were sold and used in their unique value network before they began to capture sales from higher-end professional computers.
Plastics	Plastics as a category have disrupted steel and wood, in that the "quality" of plastic parts often was inferior to those of wood and steel along the metrics by which performance was measured in traditional applications. But their low cost and ease of shaping created many new applications, and plastics have pulled many applications out of the original metal and wood value networks into the plastic network. The disruption is particularly obvious if you look at where plastics were used in automobiles thirty years ago versus today.
Portable diabetes blood glucose meters	Disrupted makers of large blood glucose testing machines in hospital laboratories, enabling patients with diabetes to monitor their own glucose levels.
Salesforce.com	This company, with its inexpensive, simple, Internet-based system, is disrupting the leading providers of customer relationship management software, such as Siebel Systems.
Seiko watches	Remember when Seiko watches were those cheap, throw-away black plastic watches? Seiko, Citizen, and Texas Instruments (which subsequently exited) disrupted the American and European watch industries.
Sonosite	This firm makes a handheld ultrasound device that now enables health care professionals who historically needed the assistance of highly trained technicians with expensive equipment to look inside the bodies of patients in their care, and thereby to provide more accurate and timely diagnoses. The company floundered for a time attempting to implement its product as a sustaining innovation. But as of the time this book was being written, it seemed to have caught its disruptive stride in an impressive way.
Sony	Sony pioneered the use of transistors in consumer electronics. Its portable radios and portable televisions disrupted firms such as RCA that made large TVs and radios using vacuum tube technology. During the 1960s and 1970s, Sony launched a series of new-market disruptions, with products such as videotape players, handheld consumer video recorders, cassette tape players, the Walkman, and the 3.5-inch floppy disk drive.

Company or product	Description
Southwest Airlines	It was a hybrid disruptor because its original strategy was to compete against driving and buses and to fly in and out of nonmainstream airports. In addition, because its prices were so low, it also took business from established airlines. Just as Wal-Mart enjoys profit protection from being in small towns whose market can support only one discount store, many of Southwest's routes offer the same protection.
SQL database software	Microsoft's SQL database software product is disrupting Oracle, which has moved up-market into expensive, integrated enterprise systems. Microsoft's Access product, in turn, is disrupting SQL.
Staples	With its direct competitors Office Max and Office Depot, Staples disrupted small stationery stores as well as commercial office supplies distributors.
Steel minimills	Have been disrupting integrated mills around the world since the mid-1960s, as recounted in the text.
Sun Microsystems	Sun, Apollo (HP), and Silicon Graphics, which built their systems around RISC microprocessors, took root in essentially the same value network as minicomputers, and disrupted them. These firms, in turn, are now being disrupted by CISC microprocessor-based computer makers such as Compaq and Dell.
Toyota	Entered the U.S. market with cheap subcompact cars like the Corona. These were so inexpensive that people who historically couldn't afford a new car now could buy one, or families could acquire a second car. Toyota now makes Lexuses, you may have noticed. Nissan has migrated from its Datsun to Infiniti, and Honda has progressed from its miniature CVCC to the Acura.
Toys 'R Us	Disrupted the toy departments of full-service and discount department stores, which has sent them up-market into higher-margin clothing.
Ultrasound	Ultrasound technology is disruptive relative to X-ray imaging. Hewlett-Packard, Accuson, and ATL created a multibillion-dollar industry by imaging soft tissues. The leading X-ray equipment makers, including General Electric, Siemens, and Philips, became leaders in the two major radical sustaining technology revolutions in imaging: CT scanning and magnetic resonance imaging (MRI). Because ultrasound was a new-market disruption, none of the X-ray companies participated in ultrasound until very recently, when they acquired major ultrasound equipment companies.
University of Phoenix	A unit of Apollo, the University of Phoenix is disrupting four-year colleges and certain professional graduate programs. It began by providing employee training courses for businesses, often de facto, but sometimes by formal contract. Its programs have expanded into a variety of open-enrollment, degree-granting programs. Today it is one of the largest

Company or product	Description
	educational institutions in the United States and is one of the leading providers of online education.
Unmanned aircraft	These machines took root initially as drone targets to uncover hidden anti-aircraft emplacements. They then moved up-market into surveillance roles, and in the 2001–2002 war in Afghanistan, moved for the first time into limited weapons-carrying roles.
Vanguard	Index mutual funds have been a low-end disruption relative to managed mutual funds. At the time of this writing, Vanguard’s assets had grown to rival closely those of the former undisputed mutual fund leader, Fidelity Management.
Veritas and Network Appliance	Network-attached storage and IP storage area networks are disruptive approaches to enterprise data storage, relative to the centralized storage systems supplied by companies such as EMC. Some of these distributed networked storage systems are so simple to augment that an office assistant can simply “snap” an additional storage server onto a network.
Wireless telephony	Cellular and digital wireless phones have been on a disruptive path against wireline phones for twenty-five years. Initially they were large, power-hungry car phones with spotty efficacy, but gradually they have improved to the point where, by some estimates, nearly one-fifth of mobile telephone users have chosen to “cut the cord” and do without wireline telephone service. The viability of the wireline long-distance business is now in jeopardy.
Xerox	Photocopying has been a new-market disruption relative to offset printing, enabling nonprinters to make copies in the convenience of their workplace. Xerox’s initial machines were so expensive and complicated that they were housed in corporate photocopy centers manned by technicians.

NOTES

1. We mentioned in [chapter 1](#) that in early stages of theory building, the best that scholars can do is suggest categories that are defined by the attributes of the phenomena. Such studies are important stepping stones in the path of progress. One such important book is Richard Foster, *Innovation: The Attacker’s Advantage* (New York: Summit Books, 1986). Another study predicted that the leaders will fail when an innovation entails development of completely new technological competencies. See Michael L. Tushman and Philip Anderson, “Technological Discontinuities and Organizational Environments,” *Administrative Science Quarterly* 31 (1986). The research of MIT Professor James M. Utterback and his colleagues on dominant designs has been particularly instrumental in moving this body of theory toward circumstance-based categorization. See, for example, James M. Utterback and William J. Abernathy, “A Dynamic Model of Process and Product

Innovation,” *Omega* 33, no. 6 (1975): 639–656; and Clayton M. Christensen, Fernando F. Suarez, and James M. Utterback, “Strategies for Survival in Fast-Changing Industries,” *Management Science* 44, no. 12 (2001): 207–220.

2. Demanding customers are those customers who are willing to pay for increases on some dimension of performance—faster speeds, smaller sizes, better reliability, and so on. Less-demanding or undemanding customers are those customers who would rather make a different trade-off, accepting less performance (slower speeds, larger sizes, less reliability, and so on) in exchange for commensurately lower prices. We depict these trajectories as straight lines because empirically, when charted on semi-long graph paper, they in fact are straight, suggesting that our ability to utilize improvement increases at an exponential pace—though a pace that is shallower than the trajectory of technological progress.

3. After watching students and managers read, interpret, and talk about this distinction between sustaining and disruptive technologies, we have observed a stunningly common human tendency to take a new concept, new data, or new way of thinking and morph it so that it fits one’s existing mental models. Hence, many people have equated our use of the term *sustaining innovation* with their preexisting frame of “incremental” innovation, and they have equated the term *disruptive technology* with the words *radical*, *breakthrough*, *out-of-the-box*, or *different*. They then conclude that disruptive ideas (as they define the term) are good and merit investment. We regret that this happens, because our findings relate to a very specific definition of disruptiveness, as stated in our text here. It is for this reason that in this book we have substituted the term *disruptive innovation* for the term *disruptive technology*—to minimize the chance that readers will twist the concept to fit into what we believe is an incorrect way of categorizing the circumstances.

4. *The Innovator’s Dilemma* notes that the only times that established companies succeeded in staying atop their industries when confronted by disruptive technologies were when the established firms created a completely separate organization and gave it an unfettered charter to build a completely new business with a completely new business model. Hence, IBM was able to remain atop its industry when minicomputers disrupted mainframes because it competed in the minicomputer market with a different business unit. And when the personal computer emerged, IBM addressed that disruption by creating an autonomous business unit in Florida. Hewlett-Packard remained the leader in printers for personal computing because it created a division to make and sell ink-jet printers that was completely independent from its printer division in Boise, which made and sold laser jet printers. Since publication of *The Innovator’s Dilemma*, a number of companies that were faced with disruption have succeeded in becoming leaders in the wave of disruption coming at them by setting up separate organizational units to address the disruption. Charles Schwab became the leading online broker; Teradyne, the maker of semiconductor test equipment, became the leader in PC-based testers; and Intel introduced its Celeron chip, which reclaimed the low end of the microprocessor market. We hope that as more established companies learn to address disruptions through independent business units when faced with disruptive opportunities, the odds that historically were overwhelmingly favorable to entrant firms and their venture capital backers will become more favorable to established leaders who seek to create new-growth opportunities.

5. An exception to this statement is found in Japan, where a couple of integrated mills have subsequently acquired existing minimill companies.

6. The economists’ simple notion that price is determined at the intersection of supply and demand curves explains this phenomenon. Price gravitates to the cash cost of the marginal, or highest-cost, producer whose capacity is required for supply to meet the quantity demanded. When the marginal producers were high-cost integrated mills, minimills could make money in rebar. When the marginal, highest-cost producers were minimills, then the price of rebar collapsed. The

same mechanism destroyed the temporary profitability to the minimills of each subsequent tier of the market, as described in the text that follows.

7. That cost reduction rarely creates competitive advantage is argued persuasively in Michael Porter, “What Is Strategy?” *Harvard Business Review*, November–December 1996, 61–78.

8. We recommend in particular Steven C. Wheelwright and Kim B. Clark, *Revolutionizing New Product Development* (New York: The Free Press, 1992); Stefan Thomke, *Experimentation Matters: Unlocking the Potential of New Technologies for Innovation* (Boston: Harvard Business School Press, 2003); Stefan Thomke and Eric von Hippel, “Customers as Innovators: A New Way to Create Value,” *Harvard Business Review*, April 2002, 74–81; and Eric von Hippel, *The Sources of Innovation* (New York: Oxford University Press, 1988).

9. This model explains quite clearly why the major airline companies in the United States are so chronically unprofitable. Southwest Airlines entered as a new-market disruptor (a concept defined in [chapter 3](#)), competing within Texas for customers who otherwise would not have flown at all, but would have used automobiles and buses. The airline has grown carefully into non-major airports, staying away from head-on competition against the majors. It is the low-end disruptor to this industry—airlines with names such as JetBlue, AirTran, People Express, Florida Air, Reno Air, Midway, Spirit, Presidential, and many others—that create the chronic unprofitability.

When leaders in most other industries get attacked by low-end disruptors, they can run away up-market and remain profitable (and often improve profitability) for some time. The integrated steel companies fled up-market away from the minimills. The full-service department stores fled up-market into clothing, home furnishings, and cosmetics when the discount department stores attacked branded hard goods such as hardware, paint, toys, sporting goods, and kitchen utensils at the low-margin end of the merchandise mix. Today, the discount department stores such as Target and Wal-Mart are fleeing up-market into clothing, home furnishings, and cosmetics as hard goods discounters such as Circuit City, Toys ‘R Us, Staples, Home Depot, and Kitchens Etc. attack the low end; and so on.

The problem in airlines is that the majors cannot flee up-market. Their high fixed-cost structure makes it impossible to abandon the low end. Hence, low-end disruptors easily enter and attack; once one of them gets big enough, however, the major airlines declare that enough is enough, and they turn around and fight. This is why no low-end disruptor to date has survived for longer than a few years. But because low-end disruption by new companies is so easy to start, the majors can never raise low-end pricing up to levels of attractive profitability.

10. This history is recounted in a marvelous paper by Richard S. Rosenbloom, “From Gears to Chips: The Transformation of NCR and Harris in the Digital Era,” working paper, Harvard Business School Business History Seminar, Boston, 1988.

11. We would be foolish to claim that it is impossible to create new-growth companies with a sustaining, leap-beyond-the-competition strategy. It is more accurate to say that the odds of success are very, very low. But some sustaining entrants have succeeded. For example, EMC Corporation took the high-end data storage business away from IBM in the 1990s with a different product architecture than IBM’s. But as best we can tell, EMC’s products were *better* than IBM’s in the very applications that IBM served. Hewlett-Packard’s laser jet printer business was a sustaining technology relative to the dot-matrix printer, a market dominated by Epson. Yet Epson missed it. The jet engine was a radical but sustaining innovation relative to the piston aircraft engine. Two of the piston engine manufacturers, Rolls-Royce and Pratt & Whitney, navigated the transition to jets successfully. Others, such as Ford, did not. General Electric was an entrant in the jet revolution, and became very successful. These are anomalies that the theory of disruption cannot explain. Although our bias is to assume that most managers most of the time are on top of their businesses and manage them in competent ways, it is also true that sometimes managers simply fall asleep at the switch.

12. This partially explains, for example, why Dell Computer has been such a successful disruptor—because it has raced up-market in order to compete against higher-cost makers of workstations and servers such as Sun Microsystems. Gateway, in contrast, has not prospered to the same extent even though it had a similar initial business model, because it has not moved up-market as aggressively and is stuck with undifferentiable costs selling undifferentiable computers. We believe that this insight represents a useful addendum to Professor Michael Porter’s initial notion that there are two viable types of strategy—differentiation and low cost (Michael Porter, *Competitive Strategy* [New York: Free Press, 1980]). The research of disruption adds a dynamic dimension to Porter’s work. Essentially, a low-cost strategy yields attractive profitability only until the higher-cost competitors have been driven from a tier in the market. Then, the low-cost competitor needs to move up so that it can compete once again against higher-cost opponents. Without the ability to move up, a low-cost strategy becomes an equal-cost strategy.

13. See Clayton M. Christensen, *The Innovator’s Dilemma* (Boston: Harvard Business School Press, 1997), 130.

14. The concept of value networks was introduced in Clayton M. Christensen, “Value Networks and the Impetus to Innovate,” [chapter 2](#) in *The Innovator’s Dilemma*. Professor Richard S. Rosenbloom of the Harvard Business School originally identified the existence of value networks when he advised Christensen’s early research. In many ways, the situation in a value network corresponds to a “Nash equilibrium,” developed by Nobel laureate John Nash (who became even more renowned through the movie *A Beautiful Mind*). In a Nash equilibrium, given Company A’s understanding of the optimal, self-interested (maximum-profit) strategy of each of the other companies in the system, Company A cannot see any better strategy for itself than the one it presently is pursuing. The same holds true for all other companies in the system. Hence, none of the companies is motivated to change course, and the entire system therefore is relatively inert to change. Insofar as the companies within a value network are in a Nash equilibrium, it creates a drag that constrains how fast customers can begin utilizing new innovations. This application of Nash equilibriums to the uptake of innovations was recently introduced in Bhaskar Chakravorti, *The Slow Pace of Fast Change* (Boston: Harvard Business School Press, 2003). Although Chakravorti did not make the linkage himself, his concept is a good way to visualize two things about the disruptive innovation model. It explains why the pace of technological progress outstrips the abilities of customers to utilize the progress. It also explains why competing against nonconsumption, creating a completely new value network, is often in the long run an easier way to attack an established market.

15. Some people have concluded on occasion that when the incumbent leader doesn’t instantly get killed by a disruption, the forces of disruption somehow have ceased to operate, and that the attackers are being held at bay. (See, for example, Constantinos Charitou and Constantinos Markides, “Responses to Disruptive Strategic Innovation,” *MIT Sloan Management Review*, Winter 2003, 55.) These conclusions reflect a shallow understanding of the phenomenon, because disruption is a process and not an event. The forces are operating all of the time in every industry. In some industries it might take decades for the forces to work their way through an industry. In other instances it might take a few years. But the forces—which really are the pursuit of the profit that is associated with competitive advantage—are always at work. Similarly, other writers on occasion have noticed that the leader in an industry actually did not get killed by a disruption, but skillfully caught the wave. They then conclude that the theory of disruption is false. This is erroneous logic as well. When we see an airplane fly, it does not disprove the law of gravity. Gravity continues to exert force on the flying plane—it’s just that engineers figured out how to deal with the force. When we see a company succeed at disruption, it is because the management team figured out how to harness the forces to facilitate success.

16. See Clayton M. Christensen and Richard S. Tedlow, “Patterns of Disruption in Retailing,” *Harvard Business Review*, January–February 2000, 42–45.

17. Ultimately, Wal-Mart was able to create processes that turned assets faster than Kmart. This allowed it to earn higher returns at comparable gross profit margins, giving Wal-Mart a higher sustainable growth rate.

18. The reason it is so much easier for firms in the position of the full-service department stores to flee from the disruption rather than stand to fight it is that in the near term, inventory and asset turns are hard to change. The full-service department stores offered to customers a much broader product selection (more SKUs per category), which inevitably depressed inventory turns. Discounters not only offered a narrower range of products that focused only on the fastest-turning items, but also their physical infrastructure typically put all merchandise on the sales floor. Department stores, in contrast, often had to maintain stockrooms to provide back-up for the limited quantities of any given item that could be placed on their SKU-laden shelves. Hence, when disruptive discounters invaded a tier of their merchandise mix from below, the department stores could not readily drop margins and accelerate turns. Moving up-market where margins still were adequate was always the more feasible and attractive alternative.

19. Low-end disruptions are a direct example of what economist Joseph Schumpeter termed “creative destruction.” Low-end disruptions create a step-change cost reduction within an industry—but it is achieved by entrant firms destroying the incumbents. New-market disruption, in contrast, entails a period of substantial creative creation—new consumption—before the destruction of the old occurs.

20. For a deeper exploration of the macroeconomic impact of disruption, see Clayton M. Christensen, Stuart L. Hart, and Thomas Craig, “The Great Disruption,” *Foreign Affairs* 80, no. 2 (March–April 2001): 80–95; and Stuart L. Hart and Clayton M. Christensen, “The Great Leap: Driving Innovation from the Base of the Pyramid,” *MIT Sloan Management Review*, Fall 2002, 51–56. The *Foreign Affairs* paper asserts that disruption was the fundamental engine of Japan’s economic miracle of the 1960s, 1970s, and 1980s. Like other companies, these disruptors—Sony, Toyota, Nippon Steel, Canon, Seiko, Honda, and others—have soared to the high end, now producing some of the world’s highest-quality products in their respective markets. Like the American and European companies that they disrupted, Japan’s giants are now stuck at the high end of their markets, where there is no growth. The reason America’s economy did not stagnate for an extended period after its leading companies got pinned to the high end was that people could leave those companies, pick up venture capital on the way down, and start new waves of disruptive growth. Japan’s economy, in contrast, lacks the labor market mobility and the venture capital infrastructure to enable this. Hence, Japan played the disruptive game once and profited handsomely. But it is stuck. There truly seem to be microeconomic roots to the country’s macroeconomic malaise. The *Sloan* paper builds upon the *Foreign Affairs* piece, asserting that today’s developing nations are an ideal initial market for many disruptive innovations, and that disruption is a viable economic development policy.

21. Our choice of wording in this paragraph is important. When customers cannot differentiate products from each other on any dimension that they can value, then price is often the customer’s basis of choice. We would not say, however, that when a consumer buys the lowest-priced alternative, the axis of competition is cost based. The right question to ask is whether customers will be willing to pay higher prices for further improvements in functionality, reliability, or convenience. As long as customers reward improvements with commensurately higher prices, we take it as evidence that the pace of performance improvement has not yet overshot what customers can use. When the marginal utility that customers receive from additional improvements on any of these dimensions approaches zero, then cost is truly the basis of competition.

[22](#). We emphasize the term *product* strategy in this sentence because there certainly seems to be scope for two other low-end disruptive plays in this market. One would be a private-label strategy to disrupt the Hewlett-Packard brand. The other would be a low-cost distribution strategy through an online retailer such as Dell Computer.

[23](#). There actually is a fourth strategy to be evaluated here—making components for sale to Hewlett-Packard and its subsystem suppliers. We will discuss this strategy at greater length in [chapters 4](#) and [5](#).

[24](#). Matsushita, in fact, attempted entry with a sustaining strategy of exactly this sort in the 1990s. Despite its strong Panasonic brand and its world-class capabilities in assembling electromechanical products, the company has been bloodied and has captured minimal market share.

CHAPTER SEVEN

IS YOUR ORGANIZATION CAPABLE OF DISRUPTIVE GROWTH?

Who should we choose to run new-growth businesses? Which organizational unit in the company will do the best job of building a successful growth business around this particular idea, and which units will likely botch it? What is the best way to structure the team that develops and launches this product? When is creating an autonomous organization important for success, and when is it folly? How can we predict precisely what an organizational unit is capable and incapable of accomplishing? How can we create new capabilities?

A surprising number of innovations fail not because of some fatal technological flaw or because the market isn't ready. They fail because responsibility to build these businesses is given to managers or organizations whose capabilities aren't up to the task. Corporate executives make this mistake because most often the very skills that propel an organization to succeed in sustaining circumstances systematically bungle the best ideas for disruptive growth. An organization's *capabilities* become its *disabilities* when disruption is afoot.¹ This chapter offers a theory to guide executives as they choose a management team and build an organizational structure that together will be capable of building a successful new-growth business. It also outlines how the choices of managers and structure ought to vary by circumstance.

Resources, Processes, and Values

What does this awfully elastic term *capability* really mean? We've found it helpful to unpack the concept of capabilities into three classes or sets of factors that define what an organization can and cannot accomplish: its resources, its processes, and its values—a triptych we refer to as the RPV framework. Although each of these terms requires careful definition and analysis, taken together we've found that they provide a powerful way to assess an organization's capabilities and disabilities in ways that can make disruptive innovation much more likely to succeed.²

Resources

Resources are the most tangible of the three factors in the RPV framework. Resources include people, equipment, technology, product designs, brands, information, cash, and relationships with suppliers, distributors, and customers. Resources are usually people or things—they can be hired and fired, bought and sold, depreciated or built. Most resources are visible and often are measurable, so managers can readily assess their value. They tend to be quite flexible as well: It is relatively easy to transport them across the boundaries of organizations. An engineer who is a valuable contributor in a large company can quickly become a valuable contributor in a start-up. Technology that was developed for telecommunications can be valuable in health care. Cash is a very flexible resource.

Of all the resource choices required to successfully build new-growth businesses, the one that most often trips a venture up is the choice of its managers. We have examined innumerable failed efforts to create new-growth business and would estimate that in as many as half of these cases, those close to the situation judge that, in retrospect, the wrong people had been chosen to lead the venture.³ Why is the selection process for key managerial resources so vexingly unpredictable?

Why Those with the Right Stuff Are Often the Wrong People

We suspect that the mistakes happen when firms choose managers at any level—from CEO to business unit head to project manager—based on

what we call “right stuff” thinking, borrowing the term from Tom Wolfe’s famous book and the 1983 movie of the same name.⁴ Many search committees and hiring executives classify candidates by right-stuff attributes. They assume that successful managers can be identified using phrases such as “good communicator,” “results oriented,” “decisive,” and “good people skills.” They often look for an uninterrupted string of past successes to predict that more successes are in store. The theory in use is that if you find someone with a track record and with the right-stuff attributes, then he or she can successfully manage the new business venture. But in the parlance of this book, right-stuff thinking gets the categories wrong.⁵

An alternative, circumstance-based theory articulated by Professor Morgan McCall can, in our view, serve as a much more reliable guide for executives who are attempting to get the right people in the right positions at the right time.⁶ McCall asserts that the management skills and intuition that enable people to succeed in new assignments were shaped through their experiences in previous assignments in their careers. A business unit therefore can be thought of as a school, and the problems that managers have confronted within it constitute the “curriculum” that was offered in that school. The skills that managers can be expected to have and lack, therefore, depend heavily upon which “courses” they did and did not take as they attended various schools of experience.

Managers who have successfully worked their way up the ladder of a stable business unit—for example, a division that manufactures standard high-volume electric motors for the appliance industry—are likely to have acquired the skills that were necessary to succeed in that context. The “graduates” of this school would have finely honed operational skills in managing quality programs, process improvement teams, and cost-control efforts. Even the most senior manufacturing executives from such a school would likely be weak, however, in starting up a *new* plant, because one encounters very different problems in starting up a new plant than in running a well-tuned one.

When a slowly growing firm’s leaders decide they need to launch a new-growth business to restore their company’s vitality, who should they tap to head the venture? A talented manager from the core business who has demonstrated a record of success? An outsider who has started and grown a

successful company? The school-of-experience view suggests that both of these managers might be risky hires. The internal candidate would have learned how to meet budgeted numbers, negotiate major supply contracts, and improve operational efficiency and quality, but might not have attended any “courses” on starting a new business in his or her prior career assignments. An outside entrepreneur might have learned a lot about building new fast-moving organizations, but would have little experience competing for resources and bucking inappropriate processes within a stable, efficiency-oriented operating culture.

In order to be confident that managers have developed the skills required to succeed at a new assignment, one should examine the sorts of problems they have wrestled with in the past. It is not as important that managers have succeeded with the problem as it is for them to have wrestled with it and developed the skills and intuition for how to meet the challenge successfully the next time around. One problem with predicting future success from past success is that managers can succeed for reasons not of their own making—and we often learn far more from our failures than our successes. Failure and bouncing back from failure can be critical courses in the school of experience. As long as they are willing and able to learn, doing things wrong and recovering from mistakes can give managers an instinct for better navigating through the minefield the next time around.

To illustrate how powerfully managers’ prior experiences can shape the skills that they bring to a new assignment, let us continue [chapter 4](#)’s discussion of Pandesic, the high-profile joint venture between Intel and SAP that was launched in 1997 to create a new-market disruption selling enterprise resource planning (ERP) software to small businesses. Intel and SAP hand-picked some of their most successful, tried-and-true executives to lead the venture.

Pandesic ramped to 100 employees in eight months, and quickly established offices in Europe and Asia. Within a year it had announced forty strategic partnerships with companies such as Compaq, Hewlett-Packard, and Citibank. Pandesic executives boldly announced their first product in advance of launch to warn would-be competitors to stay away from the small business marketplace. The company inked distribution and implementation agreements with the same IT consulting firms that had

served as such capable channel partners for SAP's large-company systems. The product, initially intended to be simple ERP software delivered to small businesses via the Internet, evolved into a completely automated end-to-end solution. Pandesic was a spectacular failure. It sold very few systems and shut its doors in February 2001 after having spent more than \$100 million.

It is tempting to use 20/20 hindsight to explain this failure. Pandesic's channel partners weren't motivated to sell the product because it was disruptive to their economic model. The company quickly ramped up expenses to establish a global presence, hoping to build a steeper ramp to volume. But this increased dramatically the volume required to break even. The product evolved into a complex solution instead of the simple small business software that originally was envisioned. Its features got specified and locked in before a single paying customer had used the product.

The Pandesic team did a lot of things wrong, certainly. But the truly interesting question isn't *what* they did wrong. It is how such capable, experienced, and respected managers—among the best that Intel and SAP had to offer—could have made these mistakes.

To see how managers with great track records could steer a venture so wrong, let's look at their qualifications for the task from the schools-of-experience point of view. This can be done in three steps. First, imagine yourself at Pandesic on day one, when the executives were agreeing to start this disruptive venture. With only foresight and no hindsight allowed, what challenges or problems could you predict with perfect certainty that this venture would encounter? Here are a few of the problems that we could know we would face:

- We know for sure that we aren't sure if our strategy is right—and yet we have to figure out the right strategy, develop consensus, and build a business around it.
- We don't know how this market ought to be segmented. "Small business" probably isn't right, and "industry vertical" probably isn't right. We have to figure out what jobs the customers are trying to get done, and then design products and services that do the job.

- We need to find or create a distribution channel that will be energized by the opportunity to sell this product.
- Our corporate parents will bequeath gifts upon us such as overhead, planning requirements, and budgeting cycles. We will need to accept some and fend off others.
- We need to become profitable, and we must manage perceptions and expectations so that our corporate parents will willingly continue to make the investments required to fuel our profitable growth.

Now, as the second step, let's apply McCall's theory. List the courses that we would want members of Pandesic's management team to have taken in earlier career assignments in the school of experience—experiences through which they would have developed the intuition and skill to understand and manage this set of foreseeable problems. This listing of experiences should constitute a “hiring specification” for the senior management team. Rather than specifying a set of right-stuff attributes, the first step specifies the circumstances in which the new team will be asked to manage. The second step matches those circumstances against the challenges with which the managers of the new venture need already to have wrestled.

We would, in Pandesic's instance, want a CEO who in the past had launched a venture thinking he or she had the right strategy, realized it wasn't working, and then iterated toward a strategy that did work. We'd want a marketing executive who had insightfully figured out how a just-emerging market was structured, had helped to shape a new product and service package that did an important job well for customers who had been nonconsumers, and so on.

With that list complete, our third step would be to compare that set of needed experiences and perspectives with the experiences on the resumé of the managers who led Pandesic. Despite their extraordinary track records in managing the global operations of very successful companies, none of the executives who were tapped to run this venture had faced any of these kinds of problems before. The schools of experience that they had attended taught them how to manage huge, complex, global organizations that

served established markets with well-defined product lines. None of them had ever wrestled with establishing an initial market foothold with a disruptive product.⁷

One of the most vexing dilemmas that stable corporations face when they seek to rekindle growth by launching new businesses is that their internal schools of experience have offered precious few courses in which managers could have learned how to launch new disruptive businesses. In many ways, the managers that corporate executives have come to trust the most because they have consistently delivered the needed results in the core businesses cannot be trusted to shepherd the creation of new growth. Human resources executives in this situation need to shoulder a major burden. They need to monitor where in the corporation's schools of experience the needed courses might be created, and ensure that promising managers have the opportunity to be appropriately schooled before they are asked to take the helm of a new-growth business. When managers with the requisite education cannot be found internally, they need to ensure that the management team, as a balanced composite, has within it the requisite perspectives from the right schools of experience. We will return to this challenge later in this chapter.

Finding managers who have been appropriately schooled is a critical first step in assembling the capabilities required to succeed. But it is only the first step, because the capabilities of organizations are a function of resources other than people, and of elements beyond just resources, namely, processes and values. To these we now turn.

Processes

Organizations create value as employees transform inputs of resources—the work of people, equipment, technology, product designs, brands, information, energy, and cash—into products and services of greater worth. The patterns of interaction, coordination, communication, and decision-making through which they accomplish these transformations are *processes*.⁸ Processes include the ways that products are developed and made and the methods by which procurement, market research, budgeting, employee development and compensation, and resource allocation are accomplished.

Processes differ not only in their purpose, but also in their visibility. Some processes are “formal,” in the sense that they are explicitly defined, visibly documented, and consciously followed. Other processes are “informal,” in that they are habitual routines or ways of working that have evolved over time, which people adopt simply because they work or because “... that’s the way we do things around here.” Still other methods of working and interacting have proven so effective for so long that people unconsciously follow them—they constitute the culture of the organization. Whether they are formal, informal, or cultural, however, processes define how an organization transforms inputs into things of greater value.⁹

Processes are defined or evolve de facto to address specific tasks. When managers use a process to execute the tasks for which it was designed, it is likely to perform efficiently. But when the same, seemingly efficient process is employed to tackle a very different task, it often seems bureaucratic and inefficient. In other words, a process that defines a *capability* in executing a certain task concurrently defines *disabilities* in executing other tasks.¹⁰ In contrast to the flexibility of many resources, processes by their very nature are meant not to change. They are established to help employees perform recurrent tasks in a consistent way, time after time. One reason that focused organizations perform so well is that their processes are always aligned to the tasks.¹¹

Innovating managers often try to start new-growth businesses using processes that were designed to make the mainstream business run effectively. They succumb to this temptation because the new game begins before the old game ends. Disruptive innovations typically take root at the low end of markets or in new planes of competition at a time when the core business still is performing at its peak—when it would be crazy to revolutionize everything. It seems simpler to have one-size-fits-all processes for doing things, but *very* often the cause of a new venture’s failure is that the wrong processes were used to build it.

The most crucial processes to examine usually aren’t the obvious value-adding processes involved in logistics, development, manufacturing, and customer service. Rather, they are the enabling or back-ground processes that support investment decisions. These include how market research is habitually done, how such analysis is translated into financial projections,

how plans and budgets are negotiated and how those numbers are delivered, and so on. These processes are where many organizations' most serious disabilities in creating disruptive growth businesses reside.

Some of these processes are hard to observe, and it can therefore be quite difficult to judge whether the mainstream organization's processes will facilitate or impede a new-growth business. You can make a good guess, however, by asking whether the organization has faced similar situations or tasks in the past. We would not expect an organization to have developed a process for accomplishing a particular task if it has not repeatedly addressed a task like that before. For example, if an organization has repeatedly formulated strategic plans for established businesses in existing markets, then a process that planners follow in formulating such plans likely will have coalesced, and managers will instinctively follow that process. But if that organization has not repeatedly formulated plans for competing in markets that do not yet exist, it is safe to assume that no processes for making such plans exist.¹²

Values

The third class of factors that affect what an organization can or cannot accomplish is its values. Some corporate values are ethical in tone, such as those that guide decisions to ensure patient well-being at Johnson & Johnson or that guide plant safety at Alcoa. But in the RPV framework, *values* have a broader meaning. An organization's values are the standards by which employees make prioritization decisions—those by which they judge whether an order is attractive or unattractive, whether a particular customer is more important or less important than another, whether an idea for a new product is attractive or marginal, and so on.¹³

Employees at every level make prioritization decisions. At the executive tiers, these decisions often take the form of whether or not to invest in new products, services, and processes.¹⁴ Among salespeople, they consist of on-the-spot, day-to-day decisions about which customers they will call on, which products to push with those customers, and which products not to emphasize. When an engineer makes a design choice or a production scheduler puts one order ahead of another, it is a prioritization decision.

The larger and more complex a company becomes, the more important it is for senior managers to train employees at every level, acting autonomously, to make prioritization decisions that are consistent with the strategic direction and the business model of the company. That is why successful senior executives spend so much time articulating clear, consistent values that are broadly understood throughout the organization. Over time, a company's values must evolve to conform to its cost structure or its income statement, because if the company is to survive, employees *must* prioritize those things that help the company to make money in the way that it is structured to make money.

Whereas resources and processes are often *enablers* that define what an organization *can* do, values often represent *constraints*—they define what the organization *cannot* do. If, for example, the structure of a company's overhead costs requires it to achieve gross profit margins of 40 percent, a powerful value or decision rule will have evolved that encourages employees not to propose, and senior managers to kill, ideas that promise gross margins below 40 percent. Such an organization would be *incapable* of succeeding in low-margin businesses—because you can't succeed with an endeavor that cannot be prioritized. At the same time, a different organization's values, shaped around a very different cost structure, might enable it to accord high priority to the very same project. These differences create the asymmetries of motivation that exist between disruptors and disrruptees.

Over time, the values of successful firms tend to evolve in a predictable fashion in at least two dimensions. The first relates to acceptable gross margins. As companies upgrade their products and services to capture more attractive customers in premium tiers of their markets, they often add overhead cost. As a result, gross margins that at one point were quite attractive will seem unattractive at a later point. Companies' values change as they migrate up-market.^{[15](#)}

The second dimension along which values can change relates to how big a business has to be in order to be interesting. Because a company's stock price represents the discounted present value of its projected earnings stream, most managers typically feel compelled not just to maintain growth but to maintain a constant *rate* of growth. For a \$40 million company to grow 25 percent, it needs to find \$10 million in new business the next year.

For a \$40 *billion* company to grow 25 percent, it needs to find \$10 *billion* in new business the next year. An opportunity that excites a small organization simply isn't large enough to be interesting to a very large one. One of the bittersweet rewards of success is, in fact, that as companies become large, they literally lose the capability to enter small emerging markets. Their size and success put extraordinary resources at their disposal. Yet they cannot deploy those resources against the small disruptive markets of today that will be the large markets of tomorrow, because their values will not permit it.

Executives and Wall Street financiers who engineer mega-mergers among already huge companies in order to achieve cost savings need to account for the impact of these actions on the resultant companies' values. Although the merged corporations might have more resources to throw at new-product development, their commercial organizations tend to lose their appetites for all but the biggest blockbuster opportunities. Huge size constitutes a very real *disability* in creating new-growth businesses. But as we will show later in this chapter, when large corporations keep the flexibility to have small business units within them, they can continue to have decision makers who can become excited about emerging opportunities.

The Migration of Capabilities

In the start-up stages of a business, much of what gets done is attributable to its *resources*—particularly its people. The addition or departure of a few key people can have a profound influence on its success. Over time, however, the organization's capabilities shift toward its processes and values. As people work together successfully to address recurrent tasks, processes become defined. And as the business model takes shape and it becomes clear which types of business need to be accorded highest priority, values coalesce. In fact, one reason that many soaring young hot-product companies flame out after they go public is that the key initial resource—the founding team—fails to institute the *processes* or the *values* that can help the company follow up with a sequence of hot new products.

Success is easier to sustain when the locus of the capability to innovate successfully migrates from resources to processes and values. It actually begins to matter less which people get assigned to which project teams. In large, successful management consulting firms, for example, hundreds of new MBA's join the firm every year, and almost as many leave. But they are able to crank out high-quality work year after year because their capabilities are rooted in their processes and values rather than in their resources.

As a new company's processes and values are coalescing, the actions and attitudes of the company's founder typically have a profound impact. The founder often has strong opinions about the way employees ought to work together to reach decisions and get things done. Founders similarly impose their views of what the organization's priorities need to be. If the founder's methods are flawed, of course, the company will likely fail. But if those methods are useful, employees will collectively experience for themselves the validity of the founder's problem-solving methodologies and criteria for decision-making. As they successfully use those methods of working together to address recurrent tasks, processes become defined. Likewise, if the company becomes financially successful by prioritizing various uses of its resources according to criteria that reflect the founder's priorities, the company's values begin to coalesce.

As successful companies mature, employees gradually come to assume that the priorities they have learned to accept, and the ways of doing things and methods of making decisions that they have employed so successfully, are the right way to work. Once members of the organization begin to adopt ways of working and criteria for making decisions by assumption, rather than by conscious decision, then those processes and values come to constitute the organization's *culture*.¹⁶ As companies grow from a few employees to hundreds and thousands, the challenge of getting all employees to agree on what needs to be done and how it should be done so that the right jobs are done repeatedly and consistently can be daunting for even the best managers. Culture is a powerful management tool in these situations. Culture enables employees to act autonomously and causes them to act consistently.

Hence, the location of the most powerful factors that define the capabilities and disabilities of an organization migrates over time—from resources toward visible, conscious processes and values, and then toward

culture. When the organization's capabilities reside primarily in its people, changing to address new problems is relatively simple. But when the capabilities have come to reside in processes and values and *especially* when they have become embedded in culture, change can become extraordinarily difficult.

Every organizational change entails a change in resources, processes, or values, or some combination of these. The tools required to manage each of these types of change are different. Moreover, established organizations typically face the opportunity to create new growth businesses—and the consequent requirement to utilize different resources, processes, and values—at a time when the mainstream business is still very healthy—when executives must *not* change the resources, processes, and values that enable core businesses to sustain their success. This requires a much more tailored approach to managing change than many managers have felt to be necessary, as we will discuss next.¹⁷

Selecting the Right Organizational Home for a New Disruptive Business

We noted in [chapter 2](#) that the incumbent leaders in an industry almost *always* emerge victorious in sustaining-technology battles, whereas historically they have almost always *lost* the battles of disruption. The RPV framework of organizational capabilities helps us see why the leading firms' track records differ so markedly across these two tasks. The industry leaders develop and introduce sustaining technologies over and over again: In the study of the computer disk drive industry that was the foundation of *The Innovator's Dilemma*, 111 of the 116 new technologies were sustaining ones. Year after year, as established companies introduce new and improved products in order to gain an edge over the competition, they refine processes for evaluating the technological potential and assessing their customers' needs for alternative sustaining technologies. In other words, the organizations develop a *capability* for sustaining innovation that resides in their processes. Sustaining-technology investments also fit the values of the leading companies, because they promise improved profit margins from better or cost-reduced products.¹⁸

On the other hand, disruptive innovations occur so intermittently that no company has a practiced process for handling them. Furthermore, because disruptive products typically promise lower gross profit dollars per unit sold and cannot be used by the best customers, disruptions are inconsistent with the leading companies' values. Established companies have the *resources*—the engineers, money, and technology—required to succeed at both sustaining and disruptive technologies. But their processes and values constitute *disabilities* in their efforts to succeed at disruptive innovation.

In contrast, smaller, disruptive companies are actually more capable of pursuing emerging growth markets. They lack resources, but that doesn't constrain them. Their values can embrace small markets, and their cost structures can accommodate lower margins per unit sold. Their less formal market research and resource allocation processes allow managers to proceed intuitively rather than having to be backed up by careful research and analysis. All of these advantages add up to enormous opportunity or looming disaster, depending on your perspective. Executives who are building new-growth businesses therefore need to do more than assign managers who have been to the right schools of experience to the problem. They must ensure that responsibility for making the venture successful is given to an organization whose processes will facilitate what needs to be done and whose values can prioritize those activities. The theory is that the requirements of an innovation need to fit with the host organization's processes and values, or the innovation will not succeed.

In many ways, the RPV framework is a way of thinking through the management of change of *any* sort. A change involves the creation of new resources, new processes, or new values. It is rare that wholesale change on any of these dimensions is warranted in a successful company, because usually the existing resources, processes, and values are capably supporting established, healthy businesses, even as new resources, processes, and values are needed to support new ones. If executives can stop using one-process- and one-organization-fits-all policies for all types of innovations, they can greatly improve the probabilities that their growth ventures will succeed.

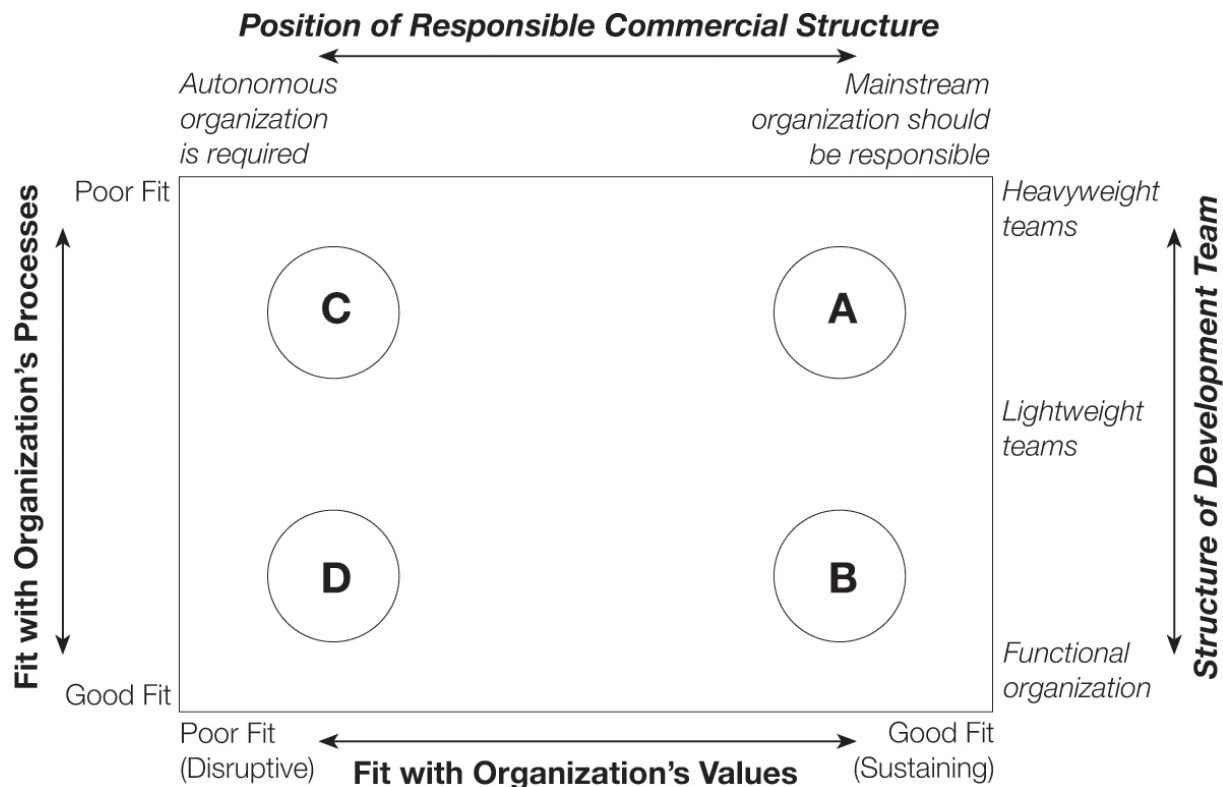
[Figure 7-1](#) offers a framework to help managers decide when they can exploit current organizational capabilities and when they should create or

acquire new capabilities to launch a new-growth business. The left vertical axis in [figure 7-1](#) measures the extent to which the existing processes—the patterns of interaction, communication, coordination, and decision-making currently used in the organization—are the ones that will get the new job done effectively. If the fit is good (toward the lower end of the scale), the project manager can exploit the organization's existing processes and coordinate work that is done within the existing functional units. If not, new processes and new types of team interactions will be required.

The lower horizontal axis asks managers to assess whether the organization's values will allocate to the new initiative the resources it will need in order to become successful. If there is a poor fit, then the mainstream organization's values will accord low priority to the project; that is, the project is potentially disruptive relative to its business model. The upper horizontal axis in [figure 7-1](#) captures on a continuum the level of autonomy needed by an organizational unit attempting to exploit an innovation. For disruptive innovations, setting up an autonomous organization to develop and commercialize the venture will be absolutely essential to its success. At the other extreme, however, if there is a strong sustaining fit, then the manager can expect that the energy and resources of the mainstream organization will coalesce behind it because the project is sustaining. There is no reason for skunkworks or spin-offs in such cases.

FIGURE 7-1

A framework for finding the right organizational structure and home



The right vertical axis maps three types of organizational structures that can be used to either exploit or overcome existing processes. The development team charged with shepherding an innovation to market can be either *heavyweight*, *lightweight*, or *functional* (all defined later in this chapter). The four regions in [figure 7-1](#) integrate the challenges of dealing with different types of fit with the mainstream organization's processes and values. Region A depicts a situation in which a manager is faced with a breakthrough but sustaining technological change. It fits the organization's values, but it presents the organization with different types of problems to solve and therefore requires new types of interaction and coordination among groups and individuals. This circumstance mandates a heavyweight project team (described later). In region B, where the project fits the company's processes as well as its values, the new venture can easily be developed by coordinating across functional boundaries within the existing organization. Region C denotes a disruptive technological change that fits

neither the organization's existing processes nor its values. To ensure success in such instances, the managers should create an autonomous organization. Region D typifies projects in which products or services similar to those in the mainstream need to be sold within a fundamentally lower-overhead business model. These ventures can leverage the main organization's logistics management processes, but they need very different budgeting, management, and profit and loss profiles.¹⁹

In using [figure 7-1](#), it is important to remember that disruption is a relative term. What is disruptive to one company might have a sustaining impact on another. For example, Dell Computer began by selling computers over the telephone. For Dell, the initiative to begin selling over the Internet was a *sustaining* innovation. It helped Dell make more money in the way it was already structured to make money. Not surprisingly Dell adopted Internet retailing very successfully. For Compaq, Hewlett-Packard, and IBM, however, marketing directly to customers was decidedly disruptive because of its impact on their retail channel partners. They couldn't make room for Internet distribution within their existing organizations, and so their attempts to incorporate this new channel were far less successful. The only way they could have succeeded at becoming leaders in marketing computers directly to customers was to have done it within an autonomous business unit, and possibly with a new brand.

Similarly, the Internet is a sustaining technology relative to catalog retailers such as Lands' End, and so we would expect them to incorporate it into their existing processes. But it is disruptive relative to bricks-and-mortar retailers such as Macy's, which would require autonomous units in order to exploit on-line retailing in a way that could create truly disruptive growth.²⁰ Similarly, the Internet is a sustaining technology to discount stockbrokers such as Ameritrade, and a disruptive technology to full-service brokers such as Merrill Lynch.

Organizations cannot disrupt themselves. So when Merrill Lynch implemented Internet-based equities trading within its mainstream brokerage organization, the effect was essentially to bring better information to Merrill's full-service brokers, to help them do an even better job servicing the needs of their high-net-worth clients. The Internet system was shaped as a sustaining technology relative to Merrill Lynch—and no other outcome would be possible. Furthermore, this was a wise thing for

Merrill Lynch to do. Its brokerage business for wealthy clients is a beautiful, profitable business, and Merrill would be crazy not to make it even better and even more profitable.²¹ But Merrill's executives should not conclude that they have addressed the threat and opportunity of discount online brokerage that is posed by Charles Schwab. They could only do that if they acquired or created an autonomous unit whose values or cost structure helps them earn attractive profits at discount prices.

This is an important reason for our observation in [chapter 4](#) that established companies are prone to cram disruptive ideas into the mainstream market, forcing them to compete against consumption on a sustaining-technology basis. As long as the strategies for developing and commercializing these disruptive innovations are developed within the mainstream organization, this is the only outcome that we can expect. An organization's processes and values ensure that it can only implement sustaining innovations.

Creating New Capabilities

The RPV model can be a useful guide for executives who determine that they need to create new capabilities because those that their organization presently has aren't well suited for building new-growth businesses. This can be framed as a make-or-buy decision. We typically frame make-or-buy decisions as relating to resources, such as training managers internally or hiring them from outside. But processes and values can also be made or bought, as the following discussion describes.

Creating Management Bench Strength

In many ways, building the management bench strength required to launch a sequence of new-growth businesses is a chicken-or-the-egg problem. Maximizing the probabilities of success means identifying managers who are able, here and now, to grapple successfully with the challenges of building new businesses. But to develop managers for the future, organizations need to put up-and-coming managers into situations and responsibilities for which they are not yet qualified. It is the only way they can learn the skills required to succeed. You need to be creating

successful businesses in order to have the right curriculum within your internal schools of experience in which next-generation managers can learn. And yet having capable managers in place is a prerequisite to building these growth businesses. Successfully wrestling with these dimensions of the innovator's dilemma is a critical responsibility of a director of human resources.

By the time a company reaches substantial size, most executives have established processes to identify a set of early-career, high-potential managers who should be prepared, ready and waiting, with the skills to succeed in the situations that will confront the company in the future. In many companies, employees are chosen for this high-potential management track based on early evidence of right-stuff attributes. In these firms, recruiting and promoting up-and-coming leaders entails sifting through lots of people in order to find those few who possess the desired end-state attributes in some nascent form.

The school-of-experience theory, however, says that potential should not be measured by attributes, but rather by the ability to *acquire* the attributes and skills needed for future situations. The talent to be sought, in other words, is the ability to learn what needs to be learned from the experiences in which the high-potential employee will be schooled in the future. By focusing on ability to learn, it is possible to avoid the trap of assuming that the finite list of competencies important for today are those that will be required in the future. A performance appraisal form targeted at identifying high-potential people would certainly cover basic technical and cognitive requirements, but would *not* ask for a ranking on right-stuff attributes. It would focus on learning-oriented measures such as “seeks opportunities to learn,” “seeks and uses feedback,” “asks the right questions,” “looks at things from new perspectives,” and “learns from mistakes.” Some attributes of a good learner will show up as achievements, of course, but the quest is to determine whether an employee is willing to learn new skills.

Putting people in positions where they will learn, however, creates its own dilemma. Those who are “ready now,” who are deemed to be fully qualified to handle a given job, by definition have the least to learn by doing it. And those who have the most to learn bring the least experience to the task. McCall notes that, as a result, many managers who are intensely focused on delivering ever-improving results often are the worst at

developing next-generation management bench strength. It takes extraordinary discipline and vision on the part of senior executives to balance the tension between deploying fully qualified employees to deliver results now versus giving learning opportunities to high-potential employees who need further development. But strike this balance they must.

Some firms deal with this tension by turning repeatedly to the labor markets, raiding other companies for people with the requisite skills already in full flower. Harkening back to [chapters 5](#) and [6](#), we believe that one reason why internal management training is becoming more pervasive is because managers don't yet perform well enough. In-house management development processes in many ways can create an optimized, interdependent interface between the skills of the manager and the processes and values of the company. In situations where management performance is not yet good enough, outsourcing "modular" managers and attempting to plug them into a company's complex, interdependent system of resources, processes, and values often does not work well.^{[22](#)}

A company that works to develop a sequence of new-growth businesses can build a virtuous cycle in management development. Launching growth business after growth business creates a set of rigorous, demanding schools in which next-generation executives can learn how to lead disruption. Companies that only sporadically attempt to create new-growth businesses, in contrast, offer to their next-generation executives precious few of the courses they need to successfully sustain growth.

Making New Processes

The right vertical axis in [figure 7-1](#) shows the kind of development team that is required to create appropriate processes for a new-growth business. When different processes need to be created, it requires what Harvard Business School Professors Kim Clark and Steven Wheelwright call a *heavyweight team*.^{[23](#)} The term refers to a group of people who are pulled out of their functional organizations and placed in a team structure that allows them to interact over different issues at a different pace and with different organizational groups than they habitually could across the boundaries of functional organizations. Heavyweight teams are tools to

create new processes, or new ways of working together. In contrast, *lightweight* or functional teams are tools to exploit existing processes.

We can use the concepts of interdependence and modularity from [chapter 5](#) to visualize a heavyweight team and understand when it is important to create one. When there is a well-defined interface between the activities of two different people or organizational groups—meaning that you can clearly specify what each is supposed to deliver, you can measure and verify what they deliver, and there are no unanticipated interdependencies between what one does and what the other must do in response—then those people and groups can interface at arm’s length and need not be on the same team. When these conditions are *not* met, then all unpredictable interdependencies should be incorporated within the boundaries of a heavyweight team. The team’s external boundary can be drawn where there are modular interfaces. New methods of working together can coalesce within this team as it addresses its task. These can then become codified as processes if the team is kept intact and addresses a similar task repeatedly.²⁴

To be successful, heavyweight teams should be co-located. Team members bring their functional *expertise* to the group, but they do not *represent* their functional group’s “interests” on the team. Their responsibilities are simply to do what needs to be done in order for the project to be successful—even if that course of action is not optimal for their functional group. Many companies have used heavyweight teams successfully as a method for creating new processes. Chrysler, for example, historically structured its product development groups around specific components, such as electrical systems. When the changing basis of competition in its industry forced Chrysler to accelerate the development of new automobiles in the early 1990s, Chrysler organized its development teams around platforms like the minivan, instead of the technical subsystems. The heavyweight teams that Chrysler created were consequently not as good at focusing on component design, but the teams forged new processes that were much faster and more efficient in creating entirely new car designs. This was a critical achievement as the basis of competition changed. Companies as diverse as Medtronic in cardiac pacemakers, IBM in disk drives, and Eli Lilly with its schizophrenia drug

Zyprexa have used heavyweight teams as vehicles for creating different, faster processes.²⁵

Drawing flow diagrams does not create radically different processes. Rather, executives build processes by giving a group of people in a heavyweight team a new problem that the organization has not confronted before. After the team has successfully addressed the challenge, the team needs to confront a similar problem again, and then again. Ultimately, this new way of working will become ensconced within the team and then can diffuse throughout the organization.

Creating New Values

Companies can create new prioritization criteria, or values, only by setting up new business units with new cost structures. Charles Schwab, for example, set up its disruptive online brokerage venture as a completely autonomous organization. It priced online trades at \$29.95, compared with the average price of nearly \$70 that Schwab had been charging for trades executed through its telephone and office-based brokers. The separate unit was indeed disruptive to the mainstream. It grew so fast that within eighteen months the company decided to fold what had been the mainstream business into the new disruptive organization. The corporation's values, which in our model are synonymous with its cost structure, were thereby transformed by launching a successful disruptive enterprise. Schwab's corporate values changed when the disruptive business displaced the old organization, whose values were incapable of prioritizing the disruptive growth business.

The reason an organization cannot disrupt itself is that successful organizations can *only* naturally prioritize innovations that promise improved profit margins relative to their current cost structure. For Schwab, therefore, it was far more straightforward to create a new business model that could view \$29.95 as a profitable proposition than it would have been to hack enough cost out of the original organization so that it could make money at the disruptive price point. This is the best way to change values because the new, disruptive game almost always must begin while the established business still has substantial, profitable sustaining potential.

What does *autonomous* mean? Our research suggests that geographical separation from the core business is not a critical dimension of autonomy. Nor is ownership structure. There is no reason why a disruptive venture cannot be wholly owned by its parent. The key dimensions of autonomy relate to processes and values. The disruptive business needs to have the freedom to create new processes and to build a unique cost structure in order to be profitable as it makes and sells even its earliest products. Making the judgment calls about which of the mainstream businesses' processes and overhead costs the new venture should and should not accept is a key role of the CEO in building new-growth businesses. We will return to this in [chapter 10](#).

Buying Resources, Processes, and Values

Managers often think that acquiring rather than developing a set of capabilities makes competitive and financial sense. Unfortunately, companies' track records in developing new capabilities through acquisition are frighteningly spotty. The RPV framework can be a useful way to frame the challenge of integrating acquired organizations. Every time one company acquires another, it buys its resources, its processes, and its values. Acquiring managers therefore need to begin by asking, "What is it that really made this company that I just bought so expensive? Did I justify the price because of its *resources*—its people, products, technology, or market position? Or was a substantial portion of its worth created by its processes and values—its unique ways of working and decision-making that have enabled the company to understand and satisfy customers; develop, make, and deliver new products in a timely way; and to do so within a cost structure that gave it disruptive potential?"

If the acquired company's processes and values are the real drivers of its success, then the last thing the acquiring manager wants to do is to integrate the company into the new parent organization. Integration will vaporize many of the processes and values of the acquired firm as its managers are required to adopt the buyer's way of doing business and have their new-growth proposals evaluated according to the decision criteria of the acquiring company. If its processes and values were the reason for its

historical success, a better strategy is to let the acquired business stand alone, and for the parent to infuse its resources into the acquired firm's processes and values. This strategy, in essence, truly constitutes the acquisition of new capabilities.

If, on the other hand, the company's *resources* were the primary rationale for the acquisition, then integrating the firm into the parent makes a lot of sense—essentially plugging the acquired people, products, technology, and customers into the parent's processes as a way of leveraging the parent's existing capabilities.

The RPV model can illuminate Daimler-Benz's acquisition of Chrysler and its subsequent efforts to integrate the two organizations. Chrysler had few resources that could be considered unique in comparison to its competitors. Much of its success in the market of the 1990s was rooted in its processes—particularly in its heavy-weight-team product design process, which could create classy new designs in twenty-four months. Chrysler's values were also worth a lot, because it could design and produce a car with one-fifth as many overhead employees as Daimler. What would have been the best way for Daimler to leverage the capabilities it acquired in Chrysler? By keeping it independent and infusing Daimler's resources into Chrysler's processes and its cost structure. Instead, as Wall Street began its demanding drumbeat for cost savings, analysts with little sense for processes and even less for values pressured Daimler management into consolidating the two organizations in order to cut costs. We suspect that integrating the two companies will compromise many of the key processes and the values that made Chrysler such an attractive acquisition.

In contrast, many of Cisco Systems' acquisitions worked well—because, we would argue, it has kept resources, processes, and values in the right perspective. Most of the companies that Cisco has acquired were small firms less than two years old: early-stage organizations whose market value was built primarily upon their resources, particularly their engineers and products. Cisco has a well-defined, deliberate process by which it essentially plugs these resources into the parent's processes and systems, and it has a carefully cultivated method of keeping the engineers of the acquired company happily on the Cisco payroll. In the process of integration, Cisco throws away whatever nascent processes and values came with the acquisition, because those weren't what Cisco paid for. On a

couple of occasions when the company acquired a larger, more mature organization—notably its 1996 acquisition of StrataCom—Cisco did not integrate. Rather, it let StrataCom stand alone, and infused its substantial resources into the organization to help it grow at a more rapid rate.²⁶

The Costs of Getting It Wrong

Great opportunities can be missed and millions of dollars wasted when managers have high-potential ideas but place them in an organizational context that is not suited to the task. Two high-profile examples of this are Bank One's effort to create WingspanBank.com in the late 1990s, and F. W. Woolworth's effort to build Woolco into a leading discount retailer in the 1960s. Let's look at them through the lens of this theory.

Bank One's Wingspan

Bank One's credit card division, First USA, worked with a leading management consulting firm to launch an online bank called Wingspan in the late 1990s. They set Wingspan up as a wholly owned but autonomous organization that would have separate customers and a separate brand; it therefore was free to pillage Bank One's business. The authors of the strategy apparently felt that the newness and disruptive nature of online banking meant that Wingspan had the best chance of success as a separate company.

The litmus tests in [chapter 2](#), however, suggest that online banking is a *sustaining* innovation relative to the business models of the leading retail banks. Online banks cannot compete against nonconsumption, because almost all computer owners and users in the United States already have bank accounts. Hence, a new-market disruption just isn't possible: Online banking can only compete against consumption. The other disruptive alternative, crafting a low-end attack, would require first finding a set of customers who are overserved by the functionality and reliability of current banking products and services and, second, entail creating a business model that can earn attractive profits at the discount prices required to win the business of customers in the least-demanding tiers of the market. Given

the high advertising costs of attracting customers and with no cost advantage in the cost of money, this also is not feasible.²⁷

Because disruption is impossible, Internet banking can only be deployed as a sustaining technology relative to the business model of retail banks. A significant portion of their best customers in fact want the convenience, and in most instances the cost per transaction is lower when it is done over the Internet than when done in a branch or via an ATM. Hence, there was no reason why Bank One needed to set this effort up separately. Indeed, in a sustaining battle the established firms almost always win.

F.W. Woolworth and Discount Retailing

In 1962 F.W. Woolworth, one of the world's leading retailers, established its discount department store arm, Woolco, as a wholly owned but autonomously managed, free-standing division—and well it should have. Discount retailing was disruptive from a values standpoint, and it required fundamentally different operating processes. Woolworth's variety stores averaged 35 percent gross margins and turned inventories over about 3.4 times per year. Discount retailing entailed average gross margins of only 23 percent, and to earn acceptable returns these retailers needed to turn inventories about 5 times per year.²⁸

In 1971, Woolworth's corporate executives decided to integrate the management, buying, and logistics functions of Woolco back into the mainstream of Woolworth in order to leverage these fixed costs across the volumes of both businesses. The result? Within a year, the values of the mainstream business had forced Woolco's margins up to 34 percent, and Woolco's inventory turns declined to four times—both mirroring the profit model of the F. W. Woolworth stores. Woolco ultimately had to be closed. Very quickly, just as we saw with Merrill Lynch's implementation of Internet brokerage, the business model of the potentially disruptive business simply had to conform itself to the processes and values of the organization in which it was housed. As a general law of organizational nature, there is no other possible outcome. Organizations cannot disrupt themselves. Managers can only do what makes sense to them, given the context in which they work. As a disruptive opportunity, Woolco needed to

remain separate. As a sustaining opportunity, Internet banking needed to be integrated within Bank One's mainstream.

Managers whose organizations are confronting opportunities to grow must first determine that they have the people and other resources required to succeed. They then need to ask two further questions: Are the processes by which work habitually gets done in the organization appropriate for this new project? And will the values of the organization give this initiative the priority it needs? Established companies can improve their odds for success in disruptive innovation if they use functionally oriented and heavyweight teams where each is appropriate, and if they commercialize sustaining innovations in mainstream organizations but put disruptive ones in autonomous organizations.

A primary reason successful innovation seems difficult and unpredictable is that firms often employ talented people whose management skills were honed to address stable companies' problems. And often, managers are set to work within processes and values that weren't designed for the new task. Instead of accepting one-size-fits-all policies, if executives will spend time ensuring that capable people work in organizations with processes and values that match the task, they will create a major point of leverage in successfully creating new growth.

NOTES

1. One of the most important studies on this topic is summarized in Dorothy Leonard-Barton, "Core Capabilities and Core Rigidities: A Paradox in Managing New Product Development," *Strategic Management Journal* 13 (1992): 111–125.

2. The concepts in this chapter attempt to build on a respected tradition of scholarship about the capabilities of organizations that is known in academic circles as the "resource-based view" (RBV) of the firm. This tradition sees resources as the defining asset of a firm, and seeks to explain interfirm differences in performance and growth in terms of differences in resource complements. See, for example, K. R. Conner, "A Historical Comparison of Resource-Based Theory and Five Schools of Thought Within IO Economics: Do We Have a New Theory of the Firm?" *Journal of Management* 17, no. 1 (1991): 121–154. The seminal works in this stream are E. T. Penrose, *The Theory of the Growth of the Firm* (London: Basil Blackwell, 1959); and B. Wernerfelt, "A Resource-Based View of the Firm," *Strategic Management Journal* 5 (1984): 171–180. More recent work includes M. Peteraf, "The Cornerstones of Competitive Advantage: A Resource-Based View," *Strategic Management Journal* 14, no. 3 (1993): 179–192; and J. Barney, "The Resource-Based Theory of the Firm," *Organization Science* 7, no. 5 (1996): 469.

We have defined "resources" far more narrowly than many RBV researchers, using additional concepts—namely, processes and values—to capture other important constituent elements of firms' capabilities that some have chosen to include in the category of resources. See, for example, D. Teece and G. Pisano, "The Dynamic Capabilities of Firms: An Introduction," *Industrial and Corporate Change* 3, no. 3 (1994): 537–556; R. M. Grant, "The Resource-Based Theory of Competitive Advantage," *California Management Review* 33, no. 3 (1991): 114–135; and J. Barney, "Organizational Culture: Can It Be a Source of Sustained Competitive Advantage?" *Academy of*

Management Review 11, no. 3 (1986): 656–665. Our belief is that what has become in many cases a debate over definitions of the phenomenon is actually a failure of categorization. The framework and theory presented in this chapter were summarized in preliminary form in a chapter added to the second edition of *The Innovator's Dilemma*. This model was initially published in Clayton Christensen and Michael Overdorf, "Meeting the Challenge of Disruptive Change," *Harvard Business Review*, March–April 2000.

3. Findings reported by managerial psychologists RHR International corroborate this estimate. RHR recently reported that up to 40 percent of newly hired senior executives either quit, significantly underperform, or are fired within two years of assuming their new positions (*Globe & Mail*, 1 April 2003, B1).

4. Tom Wolfe, *The Right Stuff* (New York: Farrar, Straus, and Giroux, 1979).

5. Consistent with our statements in [chapter 1](#) about how robust theory can bring predictability to an endeavor, much early research about how to hire the right people into the right jobs has categorized potential managers by their attributes. Remember that the early researchers in aviation observed a high correlation between the possession of attributes such as wings and feathers and the ability to fly. But they were only able to make statements about *correlation* or association, not causality. It is only when researchers identify the fundamental causal mechanism, and then understand the different circumstances in which practitioners might find themselves, that things can become highly predictable. In this case, possession of many right-stuff attributes might be quite highly correlated with success in an assignment, but it is not the fundamental causal mechanism of success.

6. Morgan McCall, *High Flyers: Developing the Next Generation of Leaders* (Boston: Harvard Business School Press, 1998). This book offers a refreshing, intellectually rigorous way of thinking about how managers learn, and of assessing whether a manager is capable of successfully addressing challenges that lie ahead. We highly recommend that practitioners who are interested in learning more about how to get the right people into the right place at the right time read the book in its entirety.

7. At a later point in the venture's development, of course, it will *need* executives who have taken these courses in the school of experience that relate to scaling a business—and later still, to efficiently operating an organization. One reason many new ventures flame out after an initial, single-product success is that the founders lack the intuition and experience in creating processes that can repeatedly create better products and produce and deliver them reliably.

8. The most logical, comprehensive characterization of processes that we have seen is in David Garvin, "The Processes of Organization and Management," *Sloan Management Review*, Summer 1998. When we use the term *processes*, we mean for it to include all of the types of processes that Garvin has defined.

9. Under various labels, many scholars have explored at length the notion of "processes" as the fundamental building block of organizational capability and competitive advantage. Perhaps among the most influential of such works is R. R. Nelson and S. G. Winter, *An Evolutionary Theory of Economic Change* (Cambridge, MA: Belknap Press, 1982). Nelson and Winter refer to "routines" rather than processes, but the fundamental concept is the same. They establish that firms build competitive advantage by developing better routines than other firms, and that superior routines are developed only through the faithful replication of effective behaviors. Once established, good routines are difficult to change. See, for example, M. T. Hannan and J. Freeman, "The Population Ecology of Organizations," *American Journal of Sociology* 82, no. 5 (1977): 929–964.

Subsequent work has explored and demonstrated the power of the concept of processes (called, variously, *organizational capabilities*, *dynamic capabilities*, and *core competencies*) as a source of competitive advantage. Examples of this work include D. J. Collis, "A Resource-Based Analysis of

Global Competition: The Case of the Bearings Industry,” *Strategic Management Journal* 12 (1991): 49–68; D. Teece and G. Pisano, “The Dynamic Capabilities of Firms: An Introduction,” *Industrial and Corporate Change* 3, no. 3 (1994): 537–556; and C. K. Prahalad and G. Hamel, “The Core Competence of the Corporation,” *Harvard Business Review*, May–June 1990, 79–91.

Our view is that although this stream of research has been extremely insightful, like the work on the resource-based view to which we referred in note 3, it suffers from the limitation either of expanding the definition of “process” to include all possible determinants of competitive advantage or, in the interests of intellectual integrity, of excluding important elements of firms’ capabilities from its scope of analysis. For more on this, see A. Nanda, “Resources, Capabilities, and Competencies,” in *Organizational Learning and Competitive Advantage*, eds. B. Moingeon and A. Edmondson (New York: The Free Press, 1996), 93–120.

[10.](#) See Leonard-Barton, “Core Capabilities and Core Rigidities.”

[11.](#) See C. Wickham Skinner, “The Focused Factory,” *Harvard Business Review*, May–June 1974.

[12.](#) Chet Huber, who was the founding president of General Motors’ OnStar telematics service, reflected for us on how critical the distinction is between resources (people) and processes: “One of my biggest lessons has been realizing that the *company* needed to be entrepreneurial and not the *individuals* within the company. [The individuals] needed to act more like synchronized swimmers to keep the organization very well aligned.” Clayton M. Christensen and Erik Roth, “OnStar: Not Your Father’s General Motors (A),” Case 9-602-081 (Boston: Harvard Business School), 12.

[13.](#) The concept of values, as we define the term here, is similar to the constructs of “structural context” and “strategic context” that have emerged in scholarly work about the resource allocation process. Important works in this tradition include J. L. Bower, *Managing the Resource Allocation Process* (Homewood, IL: Richard D. Irwin, 1972), and R. Burgelman, “Corporate Entrepreneurship and Strategic Management: Insights from a Process Study,” *Management Science* 29, no. 12 (1983): 1349–1364.

[14.](#) [Chapter 8](#) examines in much greater depth the effect that values have on resource allocation and strategy making.

[15.](#) For example, Toyota entered the North American market with its Corona model, a product targeting the lowest-priced tiers of the market. As the entry-level tier of the market became crowded with look-alike models from Nissan, Honda, and Mazda, competition among equally low-cost competitors drove down profit margins. Toyota developed more sophisticated cars targeted at higher tiers of the market in order to improve its margins. Its Corolla, Camry, 4-Runner, Avalon, and Lexus families of cars have been introduced in response to the same competitive pressures—Toyota kept its margins healthy by migrating up-market. In the process, Toyota has had to add costs to its operation to design, build, and support cars of this caliber. It subsequently decided to exit the entry-level tiers of the market, having found the margins it could earn there to be unacceptable given its changed cost structure.

Toyota recently introduced its Echo model in an attempt to reenter the entry-level tier with a \$14,000 car—reminiscent of American automakers’ periodic attempts to reestablish positions at the low end of the market. To be successful, Toyota management will have to swim against a very strong current. It is one thing for Toyota senior management to decide to launch this new model. But to implement this strategy successfully, many people in the Toyota system—including its dealers—will have to agree that selling more cars at lower margins is a better way for the company to boost profits and equity values than selling more Camrys, Avalons, and Lexuses. Only time will tell for certain whether Toyota will be successful at bucking the company’s evolved values.

[16.](#) See Edgar Schein, *Organizational Culture and Leadership* (San Francisco: Jossey-Bass, 1988). Our description of the development of an organization’s culture draws heavily from Schein’s

research.

17. Professors Michael Tushman of Harvard and Charles O'Reilly of Stanford have studied deeply the need to manage organizations in this way to create what they call "ambidextrous organizations." As we understand their work, they assert that it is not enough simply to spin off an autonomous organization to pursue important but disruptive innovations that don't match the mainstream organization's values. The reason is that too often, executives spin it off to get the disruption off their agenda so that they can focus on managing the core business. To create a truly ambidextrous organization, Tushman and O'Reilly assert that the two different organizations need to be located *within* a business unit. Responsibility for managing the disruptive and sustaining organizations needs to be at a level in the organization where the two are not treated as businesses in a portfolio. Rather, they should be within a group or business unit whose management has the bandwidth to pay careful attention to what should be integrated and shared across the groups, and what should be implemented autonomously. See Michael L. Tushman and Charles A. O'Reilly, *Winning Through Innovation: A Practical Guide to Leading Organizational Change and Renewal* (Boston: Harvard Business School Press, 2002).

18. Historically, some venture capital-backed start-ups, particularly in telecommunications and health care, have followed a strategy of developing a breakthrough sustaining innovation—leapfrogging ahead of the leader on the sustaining curve—and then quickly selling out to the larger established company that is moving up the trajectory behind them. This strategy works—not because the established companies' values constrain them from targeting the same innovation, but because their processes aren't as fast as those of the start-ups. This is a proven way to turn a profit, but it is not a route by which a new-growth business can be created. Either by acquiring the product or by outmuscling the entrant, the established company will in the end be offering the improved product as part of its product line, and the venture that developed it first will not exist. The start-ups essentially comprise heavyweight project teams, which develop products autonomously and then get disbanded when the products are ready for commercialization. It is a mechanism by which established companies with attractively priced equity can pay for research and development with equity, rather than expense.

19. Dow Corning Corporation's establishment of its Xiameter subsidiary is an example of exactly this situation. Xiameter is a high-dependability, low-overhead sales and distribution business model that allows the company to make attractive profits on commodity-level pricing of standard silicone products. Customers who need higher-cost services to guide their purchasing decisions can purchase their silicones through Dow Corning's mainstream sales and distribution structure.

20. We make this statement for illustrative purposes only. At the time of this writing, catalog and online retailing are so well established as a disruptive wave in retailing that if a department store were to attempt to create a major new online growth business, it would be following a sustaining strategy as an entrant, relative to the firms that created online retailing. Even a giant like Macy's would likely lose to the firms that are already on a sustaining march up the disruptive trajectory. Acquiring a firm that has a strong position on that disruptive trajectory—as Sears did when it bought Lands' End—is about the only way that department stores could now catch that wave.

21. Like Merrill Lynch, Goldman Sachs has also implemented Internet-based trading systems for their existing customers within their mainstream, full-service brokerage businesses. The technology was, as a consequence, implemented in a manner that sustained the values, or cost structure, of those business units. In fact, the implementation of Internet-based trading capabilities probably added cost to the companies' structures, because it was an additional option and did not displace the traditional broker-based trading channel. See Dennis Campbell and Frances Frei, "The Cost Structure and Customer Profitability Implications of Electronic Distribution Channels: Evidence from Online Banking," working paper, Harvard Business School, Boston, 2002.

22. An interesting stream of research is coming to this same conclusion. See, for example, Rakesh Khurana, *Searching for a Corporate Savior: The Irrational Quest for Charismatic CEOs* (Princeton, NJ: Princeton University Press, 2003). Khurana has found that bringing into a company high-profile “superstar” managers—those who in our parlance have many of the most coveted right-stuff attributes in abundance—meets with failure far more frequently than many have supposed.

23. See Kim B. Clark and Steven C. Wheelwright, “Organizing and Leading Heavyweight Development Teams,” *California Management Review* 34 (Spring 1992): 9–28. The concepts described in this article are extremely important. We highly recommend that managers interested in these problems study it thoughtfully. Clark and Wheelwright define a heavyweight team as one in which team members typically are dedicated and co-located. The charge of each team member is not to represent his or her functional group on the team, but to act as a *general manager*—to assume responsibility for the success of the entire project, and to be actively involved in the decisions and work of members who come from each functional area. As they work together to complete their project, they will work out new ways of interacting, coordinating, and decision-making that will come to compose the new processes, or new capabilities, that will be needed to succeed in the new enterprise on an ongoing basis. These ways of getting work done then get institutionalized as the new business or product line grows.

24. The fundamental conceptual breakthrough that leads to the conclusions in this paragraph comes from the seminal study by Rebecca M. Henderson and Kim B. Clark, “Architectural Innovation: The Reconfiguration of Existing Systems and the Failure of Established Firms,” *Administrative Science Quarterly* 35 (1990): 9–30. This is the research that, in our view, elevated the state of theory building in process research from attribute-based categories to circumstance-based categories. Their essential idea is that over a period of time, the patterns of interaction, communication, and coordination among those responsible for designing a new product (the product development process that a company follows) will come to mirror the pattern in which the components of the product interact within the architecture of the product. In the circumstance in which the architecture is unchanged from one generation to the next, this habitual process will facilitate the kinds of interactions that are necessary for success. But in the circumstance in which the development organization needs to change the architecture significantly, so that different people need to interact with different people about different topics and with different timing, the same habitual process will impede success.

In many ways, the diagnosis and recommendations about process change that are on the vertical axes of [figure 7-1](#) derive from Henderson and Clark’s work. The diagnoses and recommendations on the horizontal axes that relate to the values of the organization derive from *The Innovator’s Dilemma*, which in turn built on the work of Professors Bower and Burgelman that we have cited elsewhere. This body of research also seems to have lifted the state of theory from attribute-based categorizations to circumstance-based theory.

25. We have observed a frustrating tendency among managers to seek one-size-fits-all solutions to the challenges they face, rather than to develop a way of applying solutions that are appropriate to the problem. On this particular issue, some managers seem to have concluded in the 1990s that heavyweight teams were the “answer,” and flipped their entire development organizations into using heavyweight development teams for *all* projects. After a few years, most of them decided that heavyweight teams, while they offered benefits in terms of speed and integration, were too expensive—and they then flipped their entire organizations back into the lightweight mode. Some of the companies cited in the text have suffered these problems, and have not learned how to employ the appropriate types of teams in the appropriate circumstance.

26. See Charles A. Holloway, Steven C. Wheelwright, and Nicole Tempest, “Cisco Systems, Inc.: Acquisition Integration for Manufacturing,” Case OIT26 (Palo Alto and Boston: Stanford

University Graduate School of Business and Harvard Business School, 1998).

[27](#). We recognize that this is a dangerous statement to make; probably a more accurate statement is that at the time of this writing, nobody seems to have been able to devise a viable disruptive strategy for online banking. It is possible, for example, that E*Trade Bank is successfully building a low-end disruptive bank. We cited in note 21 one of an ongoing series of papers that Professor Frances Frei of the Harvard Business School has been writing with various coauthors about the impact of providing new service channels to customers. When established banks have added ATM, telephone, and online services to customers, they have not been able to discontinue the old channels of service, such as live tellers and loan officers. As a consequence, Frei has shown that the provision of lower-cost channels of service actually adds cost, because they are additive and not substitutive. It is possible that E*Trade Bank, without the legacy infrastructure and costs of in-person service, can actually create a business model whose costs are low enough that it can earn attractive returns at the discount prices required to win the business of overserved customers.

[28](#). A retailer's inventory turns are not simple to ratchet up (see [chapter 2](#), note 18). When heading up, retailers carry a relatively rigid structure of inventory turns into higher margin products, resulting in an immediate improvement in ROI. Heading down-market entails carrying the same rigid turnover structure into lower-margin products, resulting in an immediate hit to ROI. This is a very asymmetric part of the world.