7

Master the Pivot

I'm so glad you made this mistake. Because I want to run a company where we are moving too quickly and doing too much, not being too cautious . . . If we don't have any of these mistakes, we're not taking enough risk.

—Larry Page, Google CEO, to a Google executive who made a multimillion-dollar blunder

MAX LEVCHIN, COFOUNDER of PayPal, majored in computer science during college, where he developed an intense interest in security and encryption technology. Soon thereafter, Levchin wrote a software package running on a PalmPilot to replace the handfuls of password-generating devices that IT administrators carried around (one for each secure computer or system). After receiving hundreds of downloads and offers to develop more features for pay, Levchin moved to Silicon Valley to pursue his emerging dream of starting a company offering compact security software.

Shortly after arriving, he dropped in on an encryption technology lecture at Stanford University. Only six people were there, so it wasn't hard to start a conversation with Peter Thiel, a hedge fund manager who was interested in using encryption technology to secure financial transactions. The two immediately hit it off and soon started a company based on security software for handheld devices like the PalmPilot.

As Levchin and Thiel discussed what security product would have the biggest impact, they decided to create security software that

would allow corporations to securely access their IT systems. But rather than develop programs themselves, they began developing security software libraries to be licensed by the coming wave of software developers. Levchin recalls thinking, "'Any minute now, there'll be millions of people begging for security on their handheld devices.' [But] it just wasn't happening."[1] So the team made a major change—a pivot. In the second version of the company, they offered to develop the security software themselves for corporate customers. Unfortunately, despite initial customer enthusiasm, no paying customers materialized. So they changed course yet again. They attempted to attract consumers by offering an electronic wallet that would store credit card numbers and passwords. Unfortunately, the electronic wallet largely solved a nonproblem, because pulling out a physical wallet was a simple (and often necessary) substitute.

This led to a fourth major change in strategy, with the team trying a different solution to a different problem: provide software that would allow a PalmPilot to store money that could be electronically beamed from one PalmPilot to another. This business idea caught the attention of leading venture capital (VC) companies in Silicon Valley, leading to PayPal's first round of financing. At Buck's, a favorite restaurant for many VCs, PayPal's investors showed up with $4.5 million preloaded on a PalmPilot, which they beamed to Levchin and Thiel's PalmPilot. PayPal seemed to be on its way.

PayPal's initial growth was rapid, with downloads reaching three hundred per day, but quickly leveled off because it was limited by the roughly three million handheld PDA users in the United States. As Levchin and Thiel considered options to expand the customer base, they observed that many customers wanted to sync their PalmPilots to their computers and send money through the internet to others having computers and PalmPilots. "We came up with the idea of attaching money to an e-mail," Thiel recalls. "Since there were 120 million e-mail users in the United States, this made it much more viral. You didn't have to meet face-to-face."[2] To test the idea, the team set up a website version of PayPal that included a demo allowing users to send money attached to an e-mail. Despite trying to use the website to push downloads on the technically sophisticated

PalmPilot software, by early 2000 the team noticed a large amount of traffic from an unexpected source: users from a site called eBay began requesting use of the PayPal logo.

At first, the PayPal team felt that eBay sellers were scattered and disreputable and so pushed back. As Levchin recalls, “For a while we were fighting, tooth and nail, crazy eBay people: ‘Go away, we don’t want you.’”[3] But as website traffic continued to grow, the team began to ask themselves, “What if these are our real users?”

The team then made its fifth major change: for the next year it focused on the website, iterating like crazy to improve the site. The number of users exploded. So the team made perhaps its sixth major change: although the PalmPilot version software had attracted twelve thousand users, the website had attracted 1.5 million users, so the team shut down the PalmPilot software and became the company we know as PayPal, which was acquired a few years later by eBay for $1.5 billion.

Looking back on his experience, Levchin recalls that “the company was really not founded to do payments at all.”[4] Even though Levchin may be one of the more famous and wealthy entrepreneurs in the world, his innovation started with a faulty guess—in fact, at least four major inaccurate guesses. And he is not alone, as evidenced by some of the other pillars of the modern economy. Microsoft started by selling programming compilers and not operating systems. Symantec developed artificial intelligence products and not antivirus software. Beyond technology businesses, the makers of Listerine tried to sell it as hospital antiseptic, floor cleaner, shampoo, and aftershave before finally succeeding as a mouthwash, and Play-Doh was originally sold as wallpaper cleaner before becoming one of the most widely recognized toys of all time.

Unfortunately, finding out that you’re wrong is the very thing most corporations and most managers try to avoid—fervently. Inside and outside corporations, failures are often perceived as a mistake on the innovator’s part for not being smart enough to foresee the problem. But this is exactly the wrong attitude. No one can foresee the problem when you face uncertainty. It’s all a guess, and there’s only one way

to discover whether it's right or wrong: by testing it in the market. But because of our perceptions, most managers feel the pressure to avoid mistakes, and so they either do not innovate or try to make their first guess work, something you know by now is nearly impossible. Indeed recent research confirms that because many managers are afraid of making mistakes, established companies almost always delay until they miss the opportunity rather than pursue an opportunity and discover they were wrong.[5]

Our study of successful innovators tells us this: you should *expect* to be wrong much of the time when you operate under uncertainty. That is a fundamental part of the process and completely acceptable. The only failure is not failure itself, but failure to learn quickly enough that you were wrong.

When you do find out that you were wrong, you will need to change —or *pivot.* Many people understand the basic idea of making a change, but one of the big challenges facing any innovator is knowing when to pivot versus when to persist.

What Is a Pivot?

The word *pivot* has recently been popularized among entrepreneurs in the lean start-up movement to mean a specific type of change: as in basketball, to pivot means to adjust or change direction while keeping one foot planted.[6] The word helps you remember that you should accept change as a reality of dealing with uncertainty, but when you do change, keep one foot planted by using what you've learned rather than throwing it away. In pivoting, you change one dimension of your idea. The idea is to discover new insights that you would not have seen if you had changed multiple dimensions at once.

That said, for us the term *pivot* doesn't mean making minor changes to optimize your solution or refine your distribution strategy; that is iteration. You iterate after the data suggests that you've pretty well validated a problem, solution, or business model. In contrast, you pivot when you still haven't nailed the problem, solution, or business model so that you can try a new, more promising approach.

In some instances you want to pivot to a new problem, because the data from your experiments and prototypes reveals that the problem may not be worth solving or is beyond your skills. PayPal's early changes—from security software to an electronic wallet and finally to financial transactions—were pivots to a new problem. Levchin and Thiel discovered from early prototypes that the customer pain wasn't significant enough or the market was just too small.

You might also pivot on the right solution. PayPal's shift from PalmPilot-based to e-mail-based financial transactions was a solution pivot. The company was solving a similar customer problem but in a different way. Soon thereafter, they achieved "pivot takeoff" (we describe this shortly) with the PalmPilot product, and that confirmed it was targeting a problem worth solving. But the new computer-based solution opened the door to many more customers—anyone with access to a computer, as opposed to anyone with a PalmPilot. The change in solution also led to some changes in the business model—notably, target customers and distribution channel. The PalmPilot solution was targeted to higher-income business individuals and

required distribution through PalmPilots—preferably having the software preloaded. In contrast, the computer-based solution was targeted primarily at online sellers and buyers, such as users of eBay. This shift required a different distribution strategy, with a focus on online buying and selling sites.

You may want to pivot to a new problem, a new solution (and new customer segments), or one of the key elements of your business model: pricing strategy, customer acquisition strategy (customer relationships or channels), or cost structure (activities or resources). Because of the interdependencies between each of these steps in the innovator's method, a *problem pivot* leads to changes in the solution and business model (except in the case when you try a solution for one problem and find it actually solves a different problem). A *solution pivot* often leads to changes in different components of the business model. Finally, a pivot in one component of the business model often leads to changes in other components of the business model because of the interdependencies between components.

Don't be afraid of such changes. Instead, recognize that the goal of pivoting is to engage in systematic search and experimentation as you test various configurations of problems, solutions, and business models that might prove valuable.

Understanding When and How to Pivot

Pivoting is a powerful and liberating idea. It's liberating to recognize that no human being can guess correctly when you face uncertainty, and that part of the process is making changes to adjust to these inevitable errors. But beyond being a liberating idea, the ability to recognize when and how to pivot is a critical capability.

That being said, the literature reflects a limited understanding of ways to harness this tool effectively. To better address this gap, we conducted a two-part research project.[7] Our research suggests that, on average, change has a significant benefit by allowing managers to adjust assumptions that prove incorrect. At the same time, pivoting has its dangers. For example, sometimes people "overpivot," failing to notice key clues about a valuable opportunity. In other cases, companies "underpivot," holding on too long to an idea in search of those same key clues. Or, in a strangely counterintuitive way, innovators may be paralyzed by constantly asking themselves whether they should change. To help you avoid such traps, let's look at emerging rules of thumb for when and how to pivot.

Pivot Cycles

Our project followed ten companies to observe their innovation process. In one case, we spoke with Dan (a fictitious name), leader of an innovation team assigned to develop new software to help corporate teams improve task coordination. During our bimonthly interviews, Dan agonized over the direction of the project. He understood the importance of pivoting, and each month he made a change or two on some dimension of the customer problem, solution, or business model. Each month the customer engagement metrics either didn't improve or improved only modestly. Dan agonized over each change. He asked us, "Am I doing the right thing, or should I just try something completely new?"

From our vantage point, Dan was making several mistakes. First, he wasn't clear about which assumption he was testing. Without a hypothesis, it was hard to tell whether the idea was succeeding or failing. Dan tended to pull the plug and make a change before really understanding whether his hypothesis was true or false, because he hadn't developed a clear hypothesis. In contrast, most managers who fail to develop a clear hypothesis often have the opposite problem: they persist forever, because they never actually realize that their hypothesis was proven false. This is why Intuit executives Brad Smith and Scott Cook insist that no experiment start until there is a numerical hypothesis; in this way, they can tell whether the hypothesis was proven true or false.

Dan's second mistake was that he was changing too many things too quickly, and thus it wasn't clear what he had actually learned. The pivots and iterations felt good, because he felt he was taking action, and in some instances he saw incremental improvements. But because he didn't have a deliberate approach for when and how to pivot, he overreacted to each piece of customer feedback before he had a chance to learn what customers were telling him.

To make matters worse, Dan expended a great deal of mental energy by constantly asking himself, "Should I pivot?" Like any decision that is overanalyzed, the change decision can paralyze a

company that is constantly asking, “Should we change?” Companies that are stuck in this mode waste precious time. In addition, the indecision amplifies the tendency to abandon an idea too early by leading companies to overreact to the first bit of negative customer feedback (and there will always be some)—or underreact because they can’t make the decision to change course (a classic challenge in the early stages of design).

How can you overcome pivot paralysis while avoiding changing too early or too late? The solution: use time-bound deadlines framed to answer the most important questions you face. A lesson we learn from PayPal’s experience is the need to set pivot cycles—typically, two- to three-month cycles during which you conduct experiments to answer key questions about a problem, solution, or business model. The cycles should be structured to give enough time for testing and going deep, but also be short enough to force rapid development. At the end of a cycle, you assess the answers to your key questions and then decide whether to make a change.

As a rule, pivot cycle deadlines of two to three months or less appear to work best (sometimes they may be much shorter). Although pivot cycles may appear similar to other types of deadlines, such as a corporate product development deadline, a pivot cycle is briefer and more intense. Most product development processes range from twelve to thirty-six months, whereas we argue that you should cram a great deal of that process into a two-month window designed to answer a specific set of questions. This means that as a team you will work with the kind of intensity and focus found in start-ups and that whatever you do will not be perfect (you will have to use virtual prototypes or other rapid experiments). But the brevity of the timeline can give you the focus to work intensely and not get bogged down.

Levchin and Thiel’s experience launching PayPal is instructive. In two years they made at least five major changes. This means they tried testing a different solution every two to four months to see whether it got traction with users. However, after roughly three months without getting traction, they didn’t just continue to refine the product. Instead, they shifted to a different problem or solution. The

changes still involved software security, but they were focused on different problems or different solutions.

Like PayPal, established companies that change effectively use pivot cycles. For example, Mondelez International (Kraft) gives each innovation project a two- to three-month development period and then forces a thirty-day “go or no-go” decision period. AT&T’s innovation labs use twelve-week project cycles to test an idea before moving to a decision to pivot or persist. Amazon typically uses six-month timeframes but expects to make major changes to both the problem and the solution during that time (average three-month pivot or persist). At Intuit, most projects have a three-month deadline, after which they face a pivot-or-persist decision.

Pivot Testing

During pivot cycles, how do you determine whether you should change? Recall Dan, who led the task coordination product team and struggled with constantly making small iterations without feeling he had discovered what his customers really wanted. Dan also fell into a different trap, one that we observed among many other managers we studied: applying only one testing mode to try to understand the core problem.

There are three testing modes based on modes of learning under uncertainty: abductive, inductive, and deductive logic. *Abductive* learning is the process of making a guess, usually based on your intuition—for example, you have a guess about the product or service customers want, and you develop your guess by building a product rather than testing whether customers want it. *Inductive* learning is the process of developing a theory, usually based on your guess, using qualitative methods such as fly-on-the-wall or interviews—for example, you talk to customers in face-to-face interviews about the problems they have. Finally, *deductive* learning is the process of testing a theory, usually using quantitative methods, to prove whether your theory is correct—for example, you believe an improvement to a website might increase sales, and you use the quantitative evidence from a parallel test of two versions (called an *A/B test)* to provide evidence about which website version increases sales.

We've observed many managers mistakenly operate in a single mode. For example, Dan was addicted to the deductive mode, using quantitative tools such as user surveys and A/B testing to measure his progress. Such deductive tools are attractive because they let you test your assumptions quantitatively and obtain a statistical measure. Dan used these tests to determine whether he should make a change; then he made the change, saw a small improvement, and repeated the cycle. But where did the theory about the problem, solution, and business model come from in the first place? How do we even know whether Dan had the right theory—the right assumptions? Although Dan used quantitative tools effectively, he used only one method to test his assumptions.

In our research, less effective managers tended to rely on one method to test their ideas, particularly quantitative tools such as surveys. This was particularly true for managers in established companies, where hard data and numbers are more respected than qualitative observations. But these deductive tools are appropriate only to test a theory or assumption and not to develop a theory in the first place. For a manager running an existing business, sticking to quantitative tools can make sense, because the theory is already well established and managers are making refinements under conditions of relative certainty. But for high-uncertainty projects, sticking to one mode has serious liabilities. The most important is that you don't deeply understand the theory you're testing or know the right questions to ask.

In contrast, effective managers cycled between the available modes. They started with a guess (abductive), tested the guess qualitatively to develop a theory (using techniques like fly-on-the-wall, interviews, etc.; this is inductive learning), and then tested the theory more quantitatively (using surveys, A/B testing, etc.; this is deductive). If at any point they discovered they were wrong, they returned to an earlier point. Although it may sound obvious, a remarkable number of managers got stuck in one type of learning, most often deductive or abductive. Innovators who engaged in the complete cycle, rather than stick to a single mode, proved their assumptions true or false months earlier than those who did not.

As you enter a pivot cycle, take stock of where you stand in relation to nailing the problem, solution, or business model. Don't leap to surveys first, but instead make sure you understand your hypothesis; then test your hypothesis qualitatively to build your theory to explain what is going on, and then engage with your customers using quantitative tools.

Broad versus Narrow Pivots

Often managers ask us, “should we focus early or stay broad?” Recall that Dan’s team was changing often, but these were narrow pivots (or iterations) around the problem and solution it had identified early on, rather than broad pivots designed to cast a wide net for problems and solutions (see “Pivoting Sequentially Versus in Parallel”).

In the early stages of solving a high-uncertainty problem you need to go broad before you go narrow. In a broad pivot, you change the problem or pain point you’re trying to solve; change the technology or approach you’re using to solve the problem; or, when you get to the business model stage, you completely change distribution channels or pricing strategy—perhaps going from per-unit pricing to subscription pricing. Dan’s team focused on a particular approach—a particular software tool—to solve the problem of coordinating team tasks. Each “pivot” was really a small iteration from the initial approach. The team would have been better off making broader changes every two to three months and then narrower changes during the pivot cycle in search of what we call pivot takeoff, as discussed in the following section.

Pivoting Sequentially Versus in Parallel

Focus has immense power and plays a critical role in the innovator’s method. You need to focus on the precise customer problem, on the minimum features that drive a purchase, and on the right business model. But somewhat counterintuitively, at the start of each phase, you need to look very broadly before you focus. In this chapter we imply that broad pivots occur sequentially as you test one idea and then move to the next. But your exploration and pivots can also occur in parallel—and probably should when both uncertainty and complexity are particularly high.

For example, when Sony wanted to develop high-power rechargeable batteries, it took a very different approach to managing technical uncertainty. At the time, nickel seemed the only safe solution compared with other compounds having a high energy density, such as lithium—an element that exploded on contact with water. In the race to develop a solution, Sanyo and Matsushita (Panasonic) focused solely on the safer, but lower-energy-density, nickel-based rechargeables.

But Sony decided to take a leap into the uncertainty of simultaneously developing lithium batteries. Instead of working on a single lithium solution, Sony funded six separate projects, each working on a variation of the solution. Furthermore, instead of following the typical long development deadlines at Sony, managers met with the teams every month to assess progress, make changes (pivot), and rapidly respond to obstacles. Each project pivoted sequentially, and the various projects were pivoting in parallel. In the end, one project team found the combination of lithium-based materials that became the world standard lithium-ion batteries.

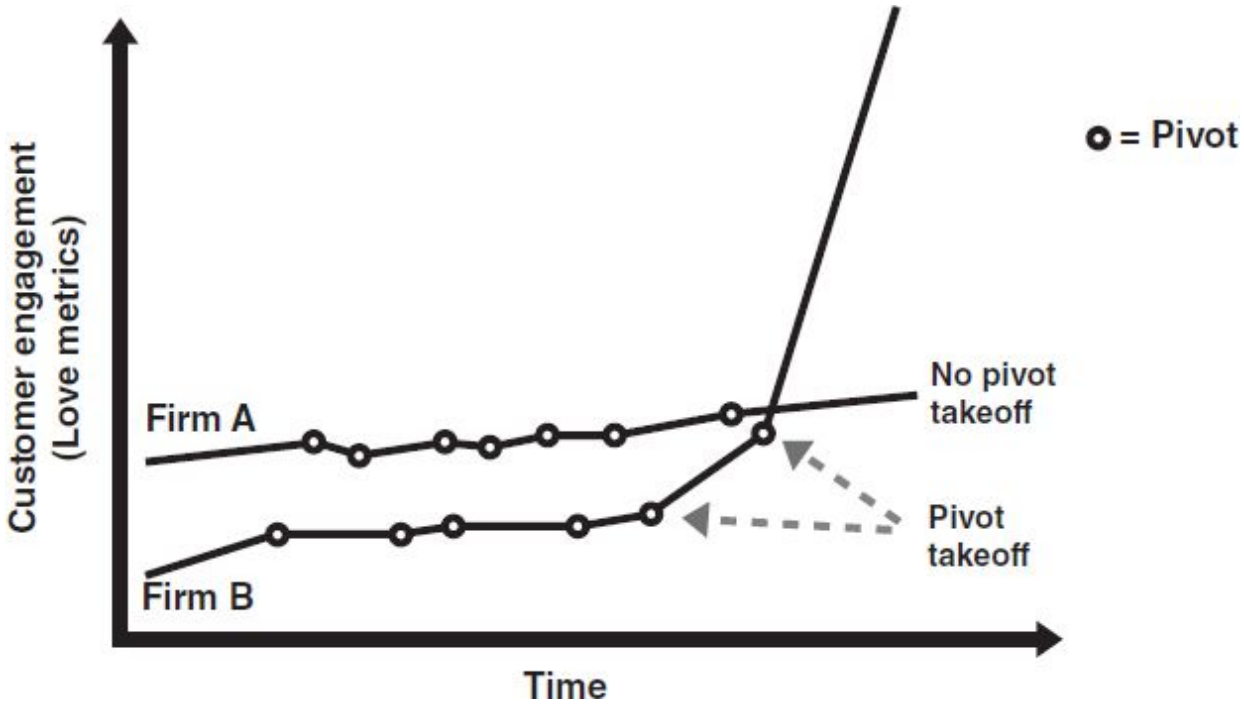
Sony’s unique approach helped it resolve the technical uncertainty faster than its competitors, which eventually were forced to follow suit, but not before ceding a four-year head start and many valuable patents to Sony. Similarly, at the start of each phase of the innovator’s method, you might also consider exploring in parallel, searching for multiple pains, solutions, or business models before pivoting to a single, focused option.

Pivot Takeoff

Should pivot cycles go on endlessly? When do you know whether you've arrived, and how do you get there? The answer: look for *pivot takeoff*. Pivot takeoff occurs when, after making a change, you see a significant change in the trajectory of customer interest (see figure 7-1). For example, recall that PayPal made several significant alterations, with only moderate interest, until after the fourth change to the PalmPilot money-transfer solution. This solution led to a dramatic increase in the customer engagement metrics, and this means that potential customers were much more likely to give the company time (the time test) and money (the payment test) and to promote the product to a friend (the promoter test). This led to a much faster rate of usage and adoption among users compared with earlier solutions. Moreover, when PayPal made the fifth change to the website that allowed e-mail money transfers, it saw yet another leap in customer interest and adoption, and this signaled that the team had nailed a solution for a great many people.

FIGURE 7-1

Pivot takeoff



Although we encourage you to embrace pivoting, ultimately what you're looking for is pivot takeoff. It indicates that either you've found a problem worth solving (the level of customer interest increases significantly) or the solution you're currently testing is at least doing a reasonable job of solving the problem (the level of commitment or payment increases markedly). For more about measuring your results, see "Use Multiple, Robust Metrics for Pivot Takeoff." As a rule, pivot takeoff typically occurs somewhere between the third and seventh pivot for most innovations—although it may take longer for more radical projects.

In contrast, if your pivots seem to yield only small improvements or decreasing returns for each change, you may be hitting the limit of what's possible with your current approach. Every circumstance is different, so use your judgment. If you don't achieve pivot takeoff after six or seven major pivots over twelve to eighteen months, it may be time to abandon your problem and solution in search of something entirely new.

Use Multiple, Robust Metrics for Pivot Takeoff

As an experienced innovator who had developed products and services worth more than a billion dollars, Mike Cassidy had lots of experience in searching for pivot takeoff. His new project, Ultimate Arena, which allowed video game players to compete for a cash pot, appeared to be doing well. The number of registered users continued to grow as advertising and PR efforts drove users to the service. Given the growth in usage and adoption, it appeared that Cassidy's team had achieved pivot takeoff.

But something troubled Cassidy as he looked at other measures of customer engagement. When he checked user engagement over time, he found that most users played a few times and then never returned. To explore why, he personally called these users and discovered a problem: although people were generally willing to lose money among friends, as during a poker game, they didn't like losing money to strangers online, against whom they felt outmatched. Even with positive growth in the number of users, without a set of returning users, Cassidy knew that over time the service would run out of new users.

He first tried some minor pivots—changing the ranking system for grouping players for competition and adjusting the fees charged—to see whether either change would keep users coming back. But in the end, the data won out. With advertising, the service continued to attract new users, but the other pivot takeoff metrics—return users, net promoter score—didn't validate the takeoff as robust. A larger pivot was necessary.

After additional observations and conversations with customers who'd left the service, Cassidy discovered that what most customers really wanted was a way to connect and play games with their friends online. So Cassidy changed the product to an instant messaging service that allowed gamers

to connect with friends and then port into their favorite game together. The new solution achieved pivot takeoff as measured not only by the number of registered users but also with return users, net promoter score, and ultimately revenues. In fact, the new solution grew like crazy, eventually becoming a major new initiative inside Vivendi's portfolio of products. But Cassidy might not have achieved such success if he had paid attention only to the single pivot takeoff metric of growth in the number of registered users.

Having multiple types of pivot takeoff metrics helps you make the tough decisions about whether to change. We recommend paying particular attention to growth in users/trials, net promoter score, or growth in users who pass the payment test. However, the data should be appropriate for the pivot. It may be X number of interviews with Y negative statements, or it may be the percentage of users who did not use your solution again. Although we've provided options for customer engagement metrics that indicate pivot takeoff, you must figure out what metrics provide a robust (reliable) measure of whether you've nailed the problem, solution, and business model for your target customers.

Mountains versus Hills: Keep Pivoting

Once you've achieved pivot takeoff, you should focus on maximizing it. After all, you're gaining traction with a solution that's working. However, takeoff doesn't mean you should quit pivoting altogether. Instead, you can move to narrower pivots and iterations as you search for an even higher trajectory of customer interest and adoption. Remember that the first uptick may be only the start of pivot takeoff, as happened with PayPal's PalmPilot application. As you focus, take care to look up periodically and ask yourself, "Is there another change we could make that could increase our trajectory even more?" Never be afraid to use the tools you've gained to explore new opportunities that you may not have previously observed.

Consider the case of Aardvark, a company whose social search engine allowed users to post questions to their social network rather than conduct an internet search. The founders believed that some questions—for example, asking for recommendations for a moving company—might be better answered by people you know than by a generic search request. At the start, the founders did an excellent job of using the tools we describe to test multiple solutions in search of pivot takeoff. For example, although most of us might start such a company by first developing the software, instead the team created a minimum viable prototype that relied on Amazon's Mechanical Turk (an online outsourcing service) to "fake" the functionality of the software by having people manually type answers to questions rather than use a software algorithm.

Although it wasn't perfect, Aardvark was able to test many aspects of the solution by faking it and quickly iterated to a fully functioning solution that achieved pivot takeoff (based on growth in customer satisfaction and usage). As Aardvark's social search solution reached one hundred thousand customers, the customer adoption metrics continued to improve, and increasingly narrow iterations of the solution led to incremental improvements in customer engagement.

All seemed to be on track, except for a recurring nuisance. Customers continually requested two features that Aardvark had not developed: a searchable database of previously answered questions, and a list of questions a user could answer. Although the features would be easy enough to develop or even fake, the Aardvark team resisted, because it contradicted the team's vision of social searches. Indeed the team argued that such features would turn Aardvark into a version of Yahoo! Answers or a similar service. Because customer engagement continued to improve, the Aardvark team decided to stay focused on its current solution and vision.[8]

Aardvark's story has a happy ending—at least for the founders and the team. Aardvark was acquired by Google for $50 million in 2010. However, it might have been an even happier ending. While Aardvark continued to iterate around its solution, another company, Quora, designed a product focused precisely on the features most requested by Aardvark's customers: searchable previously answered questions. The year after Aardvark was acquired by Google, Quora reportedly reached a valuation of more than $1 billion. (As a side note, the ending wasn't so happy, because Google shut down the Aardvark service less than a year after acquiring it.)

The sad thing for Aardvark is that, given its remarkable skills at rapidly testing assumptions, it could have easily tested the product that Quora succeeded with—but it would have required quickly testing a new solution in parallel with the existing solution, one that was not an iteration of the existing product. This is what Sony did as it searched for multiple solutions to the battery problem. For Aardvark, it would have represented a parallel pivot, although not a massive change. Of course, whether Aardvark could have succeeded in launching a product like Quora's is speculation. But comparing Aardvark's approach after achieving pivot takeoff with PayPal's is instructive.

Aardvark fell into a trap we've noticed among many other teams—what we call iterating around a hill when a pivot may lead you to a nearby mountain peak. If you think about a landscape as a metaphor for the distribution of opportunities, then flatlands or valleys represent no opportunities, hills represent small opportunities, and mountains

represent large opportunities. Researchers have long observed that companies often get trapped on a smaller hill and fail to see the nearby bigger mountains of opportunity.

In our research we observed that some teams are so excited about achieving pivot takeoff that they feel they've found the solution. After all, it feels great to find a hill when you've been in a valley. Moreover, refinements through smaller iterations will lead to small steps up the hill, and that feels like progress. The challenge is to remember that there are often mountains nearby, perhaps next door. For Aardvark, that mountain was called Quora. For PayPal, that mountain was conducting financial transactions via e-mail instead of by PalmPilot.

Of course, when you achieve pivot takeoff, you don't have to abandon the hill or mountain you've found (see "Popularity Versus Customer-Driven Pivots." PayPal didn't abandon its PalmPilot product when it launched its computer-based product. Instead, use the tools we've described here to test emerging opportunities. Your initial pivot takeoff may be a stepping-stone to an even bigger opportunity.

Popularity versus Customer-Driven Pivots

What should you do when someone powerful, influential, or talented tells you to change course, but the data suggests something else? A Swedish company we studied experienced this when it began to develop a solution analogous to Microsoft Office but for advertising agencies—a tool that would assist them in developing the next wave of dynamic advertising. After working with several global agencies for months to define the problem and solution, the company was invited to TechCrunch50, a conference for the most innovative companies of the year.

But when the team presented to the panel of judges, an extremely successful individual, comparable to the Bill Gates of entrepreneurship, began to criticize the approach, saying the company should not bother to target advertising agencies;

it was a waste of time. The Swedish team members earnestly debated: should they pivot and do something different? But in the end, they went back to the data from customers. Ultimately the data proved correct, and the team evolved to become world renowned for its prowess in advertising analytics.

We are all easily influenced by high-status individuals—an executive, an entrepreneur, a mentor, or an investor who may be known for expertise, intellect, or past successes. Sometimes these people are correct in their advice, and they should be listened to. But you need to ask whether they fit the profile of or truly understand your customer. In many cases they are not your target customer—so whatever they say needs to be measured against the data before you make the potential mistake of a popularity pivot. If you need to gather new data, do so. But don’t pivot just to be popular. As we’ve said before, innovators innovate, customers validate.

Right to Be Wrong

Pivots are an essential part of every stage of the innovator's method. You should expect to be wrong and focus instead on learning as quickly as possible and then changing when you discover that a guess was wrong. Pivots liberate you to change mistaken assumptions, and they're a powerful tool in your innovation tool kit.

Like any tool, pivoting needs to be used correctly. Set short pivot cycles that create urgency to explore your key assumptions. Rely on these cycles as key decision points rather than get mired in an endless debate about whether to change. Use the cycle to identify the key themes, rather than the random data points, that can drive the decision to modify your approach. Use multiple approaches to test your assumptions, including abductive, inductive, and deductive approaches. Furthermore, try searching various problems or solutions in parallel during the early stages—when uncertainty is especially high. The key is to be sure to explore broadly before going narrow.

Once you've achieved pivot takeoff, it can be tempting to keep your head down and make incremental changes and improvements. But don't forget to lift your eyes occasionally and ask whether there's a mountain of opportunity nearby that you're missing. Knowing when and how to change is more art than science—but using the guidelines we've offered will help you master the pivot.

8

Scale It

As soon as you start to scale, everything is going to change. Everything.

—Ryan Smith, CEO of Qualtrics

IMAGINE HOW EXCITED you will be after you've have applied the innovator's method to nail the problem, solution, and business model and you start to generate revenue. People around you are excited, and they can see that your project has begun to succeed. But now you face a new challenge: scaling your fledgling innovation. In a strangely paradoxical way, if you're particularly adept at applying the innovator's method, you may face great difficulties in making the transition to scaling. Recall in chapter 2 we argue that being a good manager can make you a bad innovator. When it comes to scaling, the opposite can also be true: being a good innovator can make you a bad manager.

Consider the case of Lew Cirne, who founded Wily Technologies to automate the complex task of diagnosing software flaws. Cirne had the initial insight while driving along Highway 17 between Palo Alto and Santa Cruz, California, feeling frustrated about his own challenges in managing the growing complexity of software projects. Early discussions with potential customers confirmed that other developers faced similar problems.

Cirne did an excellent job of prototyping a minimum awesome product, identifying the right business model, building the team, and selflessly sacrificing for the new business. Using the kinds of tools

described in this book, Cirne successfully closed initial customer sales that established a multimillion-dollar revenue stream and raised almost $40 million in venture capital. Everything seemed to be going well, and Cirne felt that he had done a great job as founder and CEO. So imagine his surprise when the board of directors replaced him.

Why did the board replace Cirne when he had accomplished so much? He acknowledged that he had not done everything perfectly in recent days. For example, as the team grew beyond twenty-five people, communication had become more difficult, and there had been a number of communication fumbles. Decision making had also become slow and challenging: the consensus decision-making process Cirne favored in the early days bogged down the process of taking action. In addition, Cirne found he needed to repeatedly step in to help close sales calls as the sales force struggled. As a result, Cirne's investors asked to bring in senior executives as advisers on the operational issues that were slowing growth. When the investors eventually asked Cirne to step aside, he wondered what he could have done to show that he could manage the company as it grew.

In fact, Cirne's story is common. Multiple studies confirm that a majority of founders are kicked out of the companies they create, and often just at the moment when revenues are skyrocketing.[1] Why?

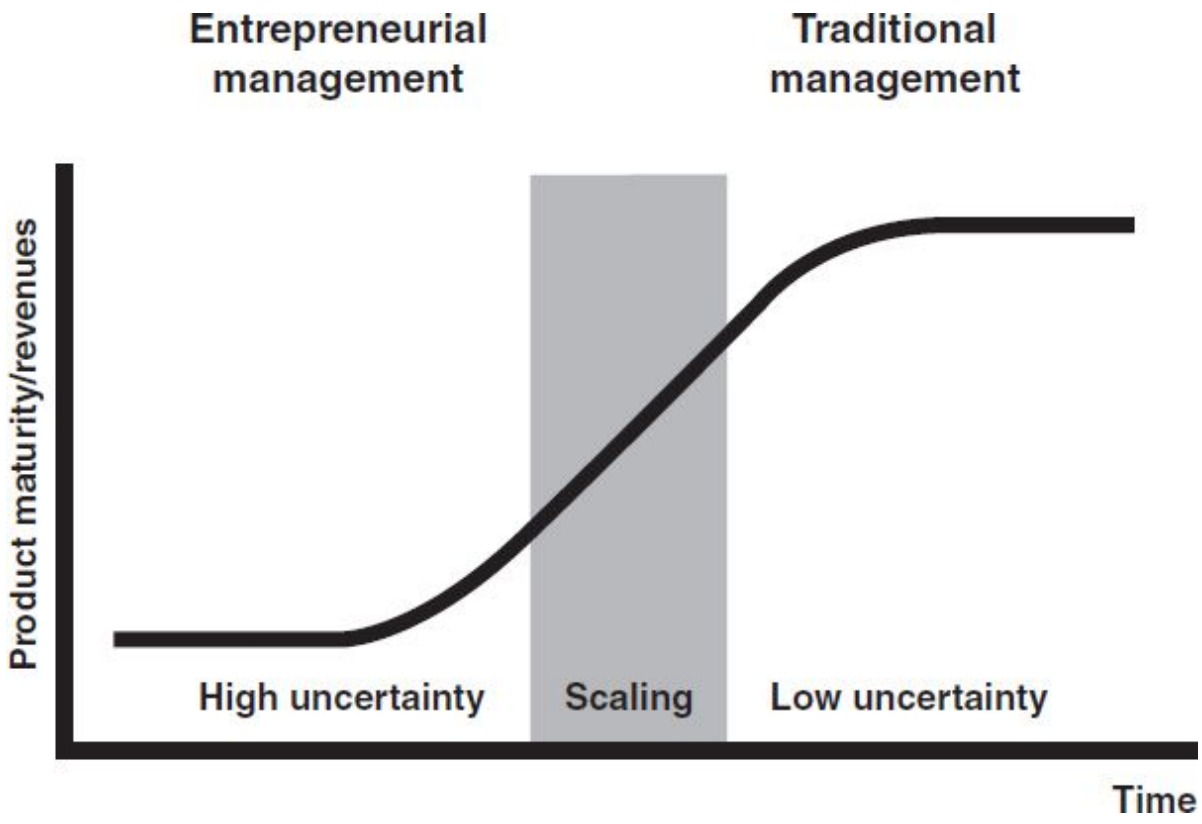
Although it may seem counterintuitive, founders are often removed for a simple reason: they aren't well equipped to make the transition from discovering the business model to scaling it. This transition is a challenging management problem, and here's why. As you apply the innovator's method to rapidly resolve the uncertainties underlying your project, hypotheses will become facts, unknowns will become knowns, and uncertainties will become certainties. As uncertainties decline, the reasons for applying entrepreneurial management begin to disappear. You enter the territory where traditional management principles focused on optimizing and capturing value are more appropriate.

As you move from innovating to executing, your project passes through a transitional phase when neither entrepreneurial management nor traditional management alone is entirely appropriate (see figure 8-1). This is the time to learn how to effectively blend the

two management practices as you transition to a mature growth business.

FIGURE 8-1

The transitional phase



Bringing an innovation from a start-up to a billion-dollar business can be compared to the human life cycle: childhood, adolescence, and adulthood. In the Middle Ages, people treated children as little adults, but now we recognize that children are different from adults: they require different training, expectations, and even different medicine than adults. In a sense, start-ups, whether inside or outside the corporation, are like children: they require a different set of management techniques than a mature business (we use the term

start-up here to refer to your innovation project whether you're pursuing it inside or outside a corporation). But just as children do not immediately become adults, as the innovation takes off and starts to scale, your innovation does not immediately become a mature business that you can manage using traditional practices. Instead, the new product passes through a series of adolescent transition steps. Just as teenagers are neither children nor adults but rather a unique blend of the two, effective scaling requires a unique blend of entrepreneurial and traditional management.

When and how should you make this transition to scaling? First, we help you recognize some of the key inflection points that indicate when it's time to scale the business. Then we discuss how to make this transition in terms of market, process, and team activities. We address how to manage the following key changes:

- *Market scaling*. Recognize when to move from a minimum awesome product to a whole-product solution and how to create the legitimacy to make the transition from early adopters to mainstream customers.
- *Process scaling*. Understand how to shift effectively from discovery processes to execution processes designed to efficiently deliver the whole-product solution without prematurely destroying your innovation capabilities.
- *Team scaling*. Identify how to get the right people with the right skills for scaling the company in place while assigning new roles to people who cannot, or will not, adapt.

Finally, we introduce you to a scaling tool used by many of the most successful managers who have scaled ideas from small teams to effective billion-dollar businesses.

Recognize When to Scale

Qualtrics, an online survey company, recently grabbed headlines as an overnight success: after rejecting a $500 million acquisition offer, it raised $100 million in funding and reportedly is valued at more than $1 billion as it grows at breakneck speed. In reflecting on his experience, CEO and founder Ryan Smith says that the company is "an overnight success . . . ten years in the making."[2] Smith adopted the title of one of our earlier books, *Nail It Then Scale It*, as the mantra for his company.[3]

Smith emphasizes that Qualtrics spent ten years nailing the problem, solution, and business model before raising millions in venture capital to scale the business. He argues that although it may seem slower at first to proceed through the phases of deeply understanding the job-to-be-done, prototyping numerous solutions, and then validating your business model before you invest to scale it, this process saved the company from failure many times. But Smith also acknowledges that once you start to scale, "everything is going to change." Asked how he recognized when Qualtrics needed to shift, his answer reflects something we've heard from other managers of growing companies: when you feel the pain, then you know you've hit an inflection point that demands a change. But what does that mean?

As a rule, you've hit an inflection point when you see the same types of problems cropping up repeatedly. It becomes evident when the percentage of time you spend solving the same problem becomes disproportionate to the cost of routinizing the problem. The pain caused by a broken process is a symptom of the needed shift from entrepreneurial to traditional management.

For example, consider the sales process for a company over its life cycle: in the early days the founding team closes most sales, and, because the product and business model are still in flux, it makes little sense to create a routinized sales template. But as new salespeople are added, problems emerge: they struggle with how to sell, what to sell (making inconsistent promises to customers that require customization), or how to close the sale (calling on the

founder to close deals). As these problems multiply and consume more time, it's a sure sign that the innovation has hit an inflection point. You need to develop a standard sales process template, based on a standardized set of products, with a standardized set of customer promises, all tracked in a system linked to each salesperson.

Of course, you still need room for flexibility—for entrepreneurial management—because at this early stage, you may still discover new uncertainties. That's why the challenge of scaling is to balance entrepreneurial and traditional management.

We've noticed two other indicators that you've hit an inflection point and it's time to scale: solution standardization and team growth. While using the innovator's method, you will pivot frequently, but eventually you should achieve pivot takeoff. Team priorities will shift from discovering what customers want, to improving the features you offer, to standardizing the features customers want. Companies that have hit this inflection point often describe the feeling of having a "haphazard" or "bag-of-bolts" solution that's always breaking. Thus, they feel the need to "redesign" or "rewrite" the product to make it more efficient or more reliable. For example, Qualtrics rewrote the core software code three times as they matured. This shift to standardizing the solution represents a key inflection point because, rather than ask what customers want, managers must ask, "How do we deliver this solution reliably and repeatedly at low cost?"

To make this change effectively, managers often must change their product development processes from search (pivoting on features) to execution (standardizing features) and their resources from flexible (variabilized costs, flexible people who can search, multipurpose tools) to fixed (fixed costs spread over a large number of units, experts who can create better solutions).

A second inflection point occurs as the team grows. Research suggests that early-stage teams are most efficient with four to eight people and become unwieldy at ten to twelve people. We've observed that when a start-up grows to employ more than twenty-five people, it has likely hit a scaling inflection point. Previously, everyone knew each other well and communicated informally, but now

communication starts failing and coordination becomes a headache, with balls being dropped. To deal with this inflection point, managers must establish formal communication processes and coordination tools (described in more detail later in the chapter). Companies must respond to this inflection point by becoming more formal, with set meeting times, tracked information systems, and standard reporting that was previously absent.

Scale the Market

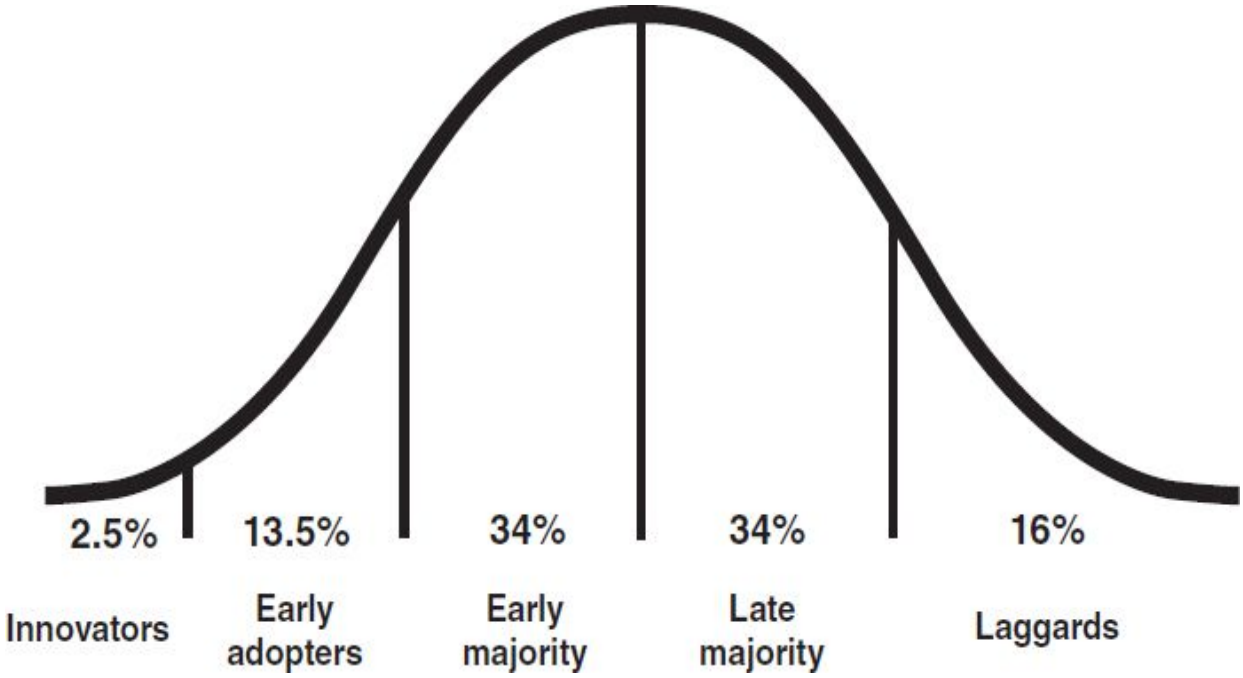
As start-ups begin to scale, they often experience initial growth followed by stagnation, a situation that perplexes the founding team. Why would sales stagnate just as the team starts to improve the product? The answer has something to do with the cornfields of Iowa. As a child in the 1930s, Everett Rogers watched as drought decimated the cornfields, including his father's crops. But not all the corn was destroyed. A few years earlier, drought-resistant seeds (which also produced a 20 percent to 25 percent higher yield) had hit the market. Although some farmers quickly adopted the higher-priced seed, others waited until, convinced by the drought of 1936, most farmers finally adopted the new seed.

Watching the family cornfields die raised important questions for Rogers about how innovations get adopted. Why had it taken so long for some farmers to adopt the seed? Why doesn't everyone adopt an innovation at the same time? In his later work *Diffusion of Innovations*, Rogers synthesized hundreds of studies, including the studies about the adoption of hybrid corn seed, and concluded that the people who adopt any innovation fall into different categories, with different needs and preferences, which affect when and how they adopt the innovation.[4]

Rogers argued that for any innovation, the groups he called the "innovators" and "early adopters" are the first to adopt because they have a higher risk tolerance and like to try new things to stay on the cutting edge. As a result, these customers are willing to overlook weaknesses in a potential innovation in the quest for an advantage. In contrast, the groups he labeled "early majority" and "late majority" have different preferences. For the most part, they want to be safe (e.g., they don't want to get fired for trying an untested idea) and so wait to adopt an innovation (see figure 8-2).

FIGURE 8-2

The technology adoption life cycle

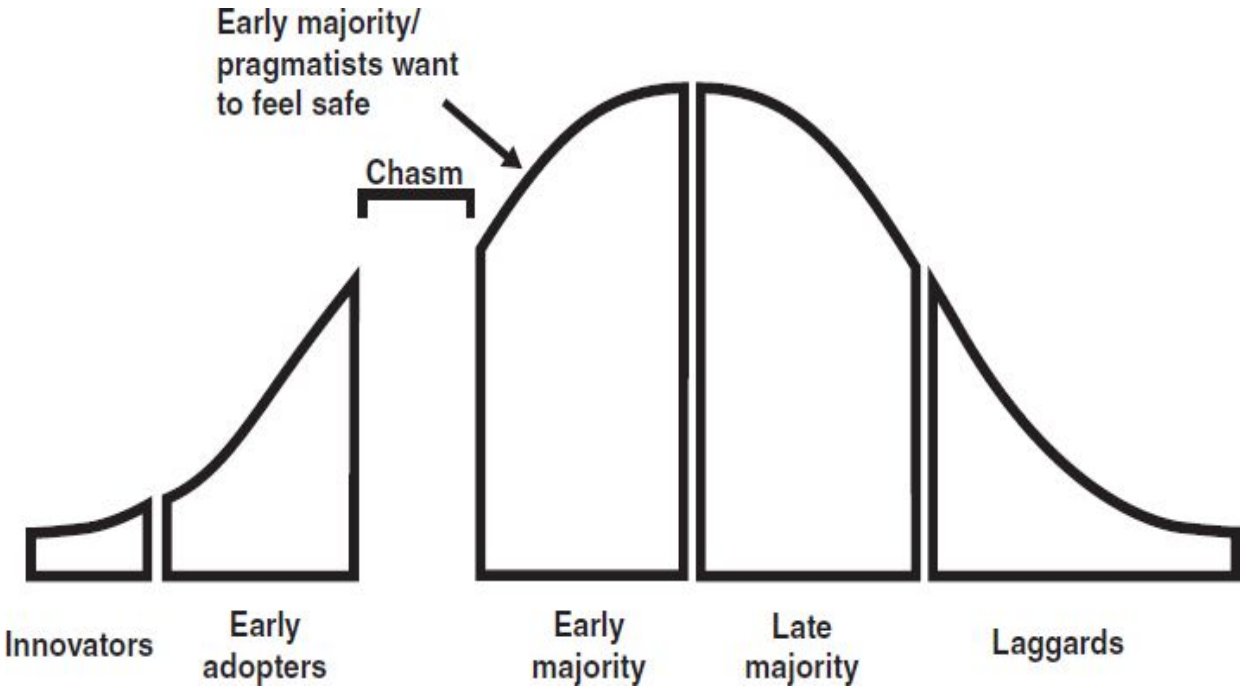


Source: adapted from Everett M. Rogers, *Diffusion of Innovations* (New York: Free Press, 1962).

This difference led a later author, Geoffrey Moore, to argue that companies face a significant challenge in “crossing the chasm” from the early customer groups to the later customer groups, because these groups want different things that innovators have a hard time satisfying (see figure 8-3).[5] Whereas early adopters are willing to try something entirely new that may not work perfectly, the early and late majority don’t want a minimum viable product: they want a “*whole product solution,”* meaning a full-featured, functional, error-free solution.

FIGURE 8-3

The chasm in the innovation adoption life cycle

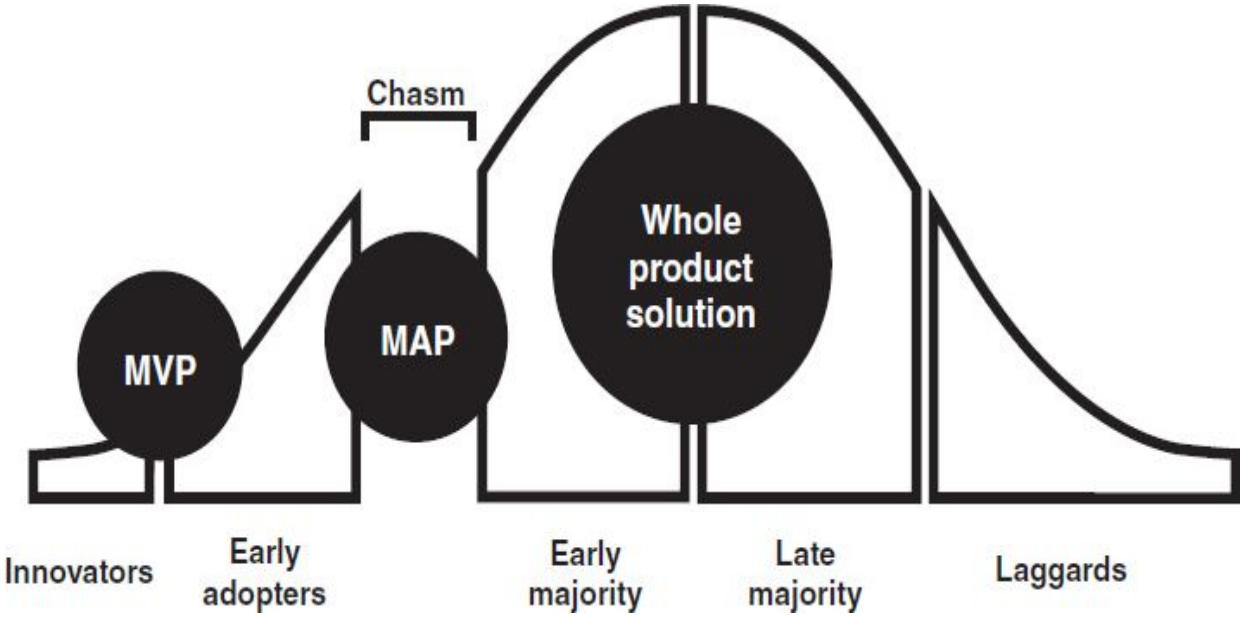


Source: adapted from Geoffrey Moore, *Crossing the Chasm* (New York: HarperBusiness, 2006).

Teams often stumble because they don't understand the innovation adoption life cycle. As we've discussed, most of us have the intuition that we need to build whole products that have broad appeal and are error-free in order to be successful. Although this intuition has an element of truth—it holds for the early and late majority—at the beginning of your project you can waste a great deal of time and resources trying to perfect your product based on untested assumptions. That's why we emphasize the importance of using virtual prototypes or an MVP to test the key assumptions with target customers. At first you may have resisted this advice because it seemed counterintuitive, but it was rooted in the fact that early adopters are more forgiving of weaknesses. Thus, you can use them as a sounding board to validate your key assumptions. Then you can use the minimum awesome product to help you to cross the chasm to your first early majority customers on your way to developing the whole-product (error-free) solution that solves the customer need robustly for a broad array of customers (see figure 8-4).

FIGURE 8-4

MVP versus whole-product solution



Source: adapted from Geoffrey Moore, *Crossing the Chasm* (New York: HarperBusiness, 2006).

As you scale, you must also adopt the tactics to cross the chasm.[6] To do this, Moore argues that you need to deeply understand why a particular group of customers is attracted to your solution and then focus your resources on that single customer niche. Your objective is to effectively communicate your message and create enough legitimacy in the minds of a few reference customers (among the early majority) so that they feel safe enough to adopt your product. These early majority reference customers serve as touch points, convincing other like-minded customers to try your product. After conquering one customer niche, you can move to a second niche and then a third.

Beyond creating a highly reliable whole-product solution, you can apply several tactics to create the legitimacy necessary to reach the mainstream market. These tactics include adopting analogies or

templates from other industries to increase familiarity with your solution, defining the industry around the company, or creating stories or advertising to reinforce the notion that the company is a leader in the product category.

For example, after Amazon.com validated its initial insights around the business model for selling books online, it faced a significant challenge: although early adopters and innovators were willing to buy from Amazon, buying anything online was unfamiliar to most people, including the early majority. To enhance legitimacy, Amazon used a number of tactics. First, it used analogies from off-line retail, such as shopping carts and checkout, to make the site feel familiar and safe.

Amazon also signaled leadership by strategically targeting a few distant customers so that it could claim it was shipping products to forty-five countries and fifty states. Similarly, the online retailer defined itself as the industry leader, claiming to be “Earth’s Biggest Bookstore”; that was true in geographic scope or product breadth, although actual revenues were tiny. And Amazon aggressively distributed stories about extraordinary customer service (for example, stories of CEO Jeff Bezos or other Amazon employees obsessively working to satisfy customer requests).

Together, these tactics worked well to create sufficient legitimacy in the minds of the early majority to use Amazon.com and then spread their experience by word of mouth.[7] Then, having conquered the books category, Amazon rolled into other online product categories.

Scale the Process

In scaling a product, a major task is to develop, and then standardize, a company's processes to deliver its whole-product solution to the market. This means adopting a key principle advocated by Frederick Taylor that we rejected at the beginning of the process: task standardization and worker specialization. We've found that start-up managers who are successful at scaling follow a simple pattern as they introduce scalable, standardized processes to the organization.

1. List all the tasks to be done to effectively execute your business model, and assign each task to an individual.
2. Have each team member write a job description for the tasks he is assigned. Then review them together so that everyone can agree on how the tasks are to be done. This also helps everyone understand who wears which hats.
3. Create a visual map of all the critical processes, noting the linkages and relationships. This diagram will help you ensure that someone has responsibility for all the key processes and handoffs. If you don't write down and make the processes visual and explicit, most of the valuable, tacit knowledge the team has gained will be lost.
4. Finally, link the tasks and processes to performance metrics, and assign accountability for those metrics to specific individuals.

Each of these steps will help you create standardized and repeatable processes.

Transparently Communicate the Transition

The best way we've discovered to manage the transition is to employ purposeful, transparent communication. During the early days of a project, communication happens naturally and informally because the team is usually small and in close physical proximity. But as the project scales, team leaders often struggle to recognize the importance of instituting a formal, transparent communication structure. But this structure supports three critical things:

- Communication of the newly adopted execution processes and activities
- Discussion of common mistakes in adopting the new process, allowing the team to unlearn old habits and learn new ones
- Acknowledgment of the tension inherent in blending experimentation and planning, letting team members see where to apply entrepreneurial management and where to apply traditional management

Qualtrics founder Ryan Smith said that in the early days the company was relatively easy to manage: there were few employees, few customers, and few metrics (mainly a couple of love metrics). But as Qualtrics started to scale, keeping track of everything became increasingly difficult. The founders struggled with how to manage the company. On the one hand, Qualtrics faced the same kinds of problems for which business schools were created: it needed to make the trains run on time and optimize its operations. On the other hand, as executives of a young company facing some remaining uncertainty, the founders sensed that they faced significant dangers in becoming too focused on execution.

As they struggled to bridge the teenage years, they adopted a culture of transparency. As Smith observes, "You can't change the way people think. You can only shape how the environment affects their decisions. It has to be peer group driven, and we do that with total, 100 percent transparency."[8] Qualtrics used a combination of meetings—such as all-hands meetings, skip-level meetings, and daily

syncs—to communicate new processes, common mistakes, and ways to balance the tension between discovery and execution (see “Communicating to Shape Process and Culture”). For example, at Qualtrics employees hold all-hands meetings every Friday. Key things happen: after the standard announcements, they highlight sales to emphasize the continued centrality of the payment test. They also discuss new execution processes and explain how to best implement them. They call out mistakes, with an award for the best mistake; then they break down ways to solve the problem for future reference. Finally, they often talk about situations where they’re still in discovery mode (e.g., opening the office in Ireland or adopting the new 360-degree feedback tool) as well as situations where they’re transitioning to execution mode. This level of transparency has helped the organizational members make sense of and adapt to rapid changes.

Communicating to Shape Process and Culture

Among the innovative ventures we observed, communication always played a major role in surviving and prospering during scaling. Similarly, transparency speeds learning and transition. Here are four types of meetings we observed in ventures that are scaling successfully.

All-hands meetings. These familiar meetings are vital. The best ones have three components: leaders highlighting the key priorities, smaller teams reporting what they’re working on, and everyone discussing key challenges and emerging solutions.

Daily sync meetings. Teams or leadership have a stand-up meeting of less than fifteen minutes in the morning to identify the key priorities and then a short end-of-day check-in to measure progress.

Skip-level meetings. The front line often has the best information about key challenges. Skip-level meetings let managers get deep into a team on the front line, rather than hear about it secondhand. At Intuit, Scott Cook regularly skips directly into an innovation team.

Outsider meetings. In a scaling venture, you can't know everything. Don't be shy about learning as much as you can from outsiders. Meet with them individually or as a company, and then interpret their advice in the context of the problems you're trying to solve.

Measure Your Progress

By changing what they measure, growing companies emphasize and encourage a change in activities. Recall Intuit's three designations for innovation projects: H1, H2, and H3, indicating increasing degrees of innovation. In contrast to H1 efforts (incremental innovations that improve core, existing businesses), the key metrics for H3 businesses are love metrics (customer activation rates, customer usage rates, net promoter score), measuring whether you've solved a significant problem. H2 businesses, in our analogy, are teenagers, and the metrics start to shift. In addition to NPS, the innovation is measured by market or margin growth as the team builds out the business model.

Based on our observations with other companies, three categories of metrics are appropriate for the three phases of growth. *Love* metrics (including measuring time, enthusiasm, recommendations [NPS], and payment) are appropriate during start-up. *Growth* metrics are appropriate for the adolescent scaling period, when you're trying to determine whether you're delivering a solution reliably with increasing economies of scale. Growth metrics include detailed measures of users (such as customer acquisition, activation, advocacy, retention, and referral) and revenues. You might also add measures that capture the efficiency of your processes, such as counts of defects, successful delivery, and so on.

Market power metrics are appropriate for a mature stage of the business, when you want to pay attention to measures of market dominance such as market share, return on assets or invested capital, and other familiar accounting measures by which we judge mature businesses.

Scale the Team

During start-up your team should largely comprise people who are good at generating insights using the five discovery skills—questioning, observing, networking, experimenting, and associating—described in chapter 3. These folks generally have a *T-shaped* expertise profile, meaning they possess deep expertise in a particular field (software engineering, anthropology, marketing, biology, etc.) but also demonstrate a breadth of knowledge in many fields. This knowledge profile helps them generate new insights, because they can see problems and solutions from many angles. However, as you start to scale, you need more *I-shaped* people—people who have a specific expertise and excel at applying that expertise to solve routine problems in that field.

As you build out the team during the growth phase, it's useful to think about balancing your mix of innovators (T-shaped) and experts (I-shaped). As you hit scaling inflection points that demand execution, you should add more I-shaped people and possibly replace some of the original T-shaped people. For example, the Big Idea Group, which uses an *American Idol* model to get new product ideas from a network of inventors, carefully manages its mix of T-shaped and I-shaped people. During the first phase of developing new product ideas, the company uses a selection panel with an 80/20 mix of innovation/execution people to meet with inventors. Once a promising idea has been selected for further development, a team with a 50/50 mix refines and tests it with prototypes. Finally, when the product has been proven and is ready to scale, the Big Idea Group moves to a 20/80 balance during the execution phase.

Our experience suggests that as the demands grow from an ever-increasing customer base, you will long for people who can execute. In fact, Corey Wride, the founder of Movie Mouth, maker of a cutting-edge software tool for teaching English, told us, "Right now I just want people who will be like vending machines: I want to put a coin in and have them spit out my request without changing it too much. What I most need now is better execution."[9]

As a general rule, only about half of the original innovation team can make the transition to scaling and execution. You may lose people you don't want to lose. After eBay acquired PayPal for $1.5 billion, Meg Whitman, CEO of eBay, went to the office of PayPal cofounder Peter Thiel to discuss plans to grow PayPal. "I noticed there were plane tickets sitting on his desk," recalls Whitman. "He said he was off to Saudi Arabia. He was ready for a new adventure and wasn't interested in scaling PayPal. Some entrepreneurs fundamentally don't like being in companies with more than about thirty to forty people."[10] Thiel went on to use his entrepreneurial management skills to cofound Palantir Technologies (based on technology developed at PayPal to detect fraudulent activity) and become the first outside investor in Facebook. Although it's not clear what contributions Thiel might have made had he stayed with eBay, be aware that during scaling you want to retain many of the talented people who helped you nail the business model. This may mean you have to find new opportunities for them.

For example, Craigslist, founded by Craig Newmark, used extensive rounds of cocreation with customers to iterate to one of the leading classifieds websites in the world: "Most of what we do is based on what people in the community suggest . . . People suggest stuff to us, we do what makes sense, and then we ask for more feedback."[11] For example, when Craigslist started to be flooded by spam ads from employers and brokers, the community suggested a solution: charge these users fees.

But as the company scaled, Newmark struggled with the management of the larger company. Fortunately, he had the foresight to recognize he wasn't well equipped to manage a large organization and brought in someone else who could. "Jim [Buckmaster] is a much better CEO. And my skills are not management skills," says Newmark. "However, I'm a really good customer-service representative."[12] The transition to a CEO who had experience running a larger organization was better for Craigslist and better for Newmark. What's more, Newmark moved to a position where he could still add value rather than moving to a different company.

Use a Scaling Tool: V2MOM

Every company we studied struggled to manage the changes demanded by scaling. In fact, every manager we studied who had successfully scaled an innovation project used a tool to help in the process. Our favorite approach was developed by Marc Benioff, chairman and CEO of Salesforce.com. This tool has proved so valuable that the leadership team continues to use it to adapt to the rapidly changing environment.[13]

This scaling tool emerged from Benioff's frustrations as a manager at Oracle during the scaling stage. Benioff recalls, "I personally lacked the tools to spell out what we needed to do and a simple process to communicate it. The problem only increased as the teams that I was managing increased."[14] When Benioff later faced the same challenges scaling Salesforce.com, he recalls feeling frustrated with the existing approaches, such as traditional budget-based planning, key performance indicators, and critical success factors. Benioff talked to leadership, personal development, and spiritual gurus and eventually developed a tool that Salesforce.com labeled V2MOM. This tool "has been used to guide every decision at Salesforce.com—from those we made in 1999 to the decisions we make today as the largest high-tech employer in San Francisco," says Benioff. "It is the core way we run our business; it allows us to define our goals and organize a principled way to execute them."[15]

The V2MOM acronym stands for vision (where you want to go), values (what things are important to you), methods (what you're going to do to get there), obstacles (what could prevent you from being successful), and measures (how you know whether you're successful). "A V2MOM is the strategic plan for the company. It can be the strategic plan for a department, it can be the strategic plan for a person's career, it can be the strategic plan for a project, just a framework to get your thoughts down," says Jim Cavalieri, SVP in charge of the V2MOM process. "It's really used to set the direction for the company for the next twelve months."[16]

Every August, Benioff sketches out the vision and values priorities for the coming year, which he shares with the top people in the executive team (see figure 8-5 for an example). The executive team then defines three values that support the vision, and then three or four prioritized methods to support each value. So, for example, if Salesforce.com had a value of “growth,” it would support this with about three prioritized methods to support and generate growth, such as specific product plans around its cloud services. In addition, the team identifies obstacles to implementing each method, as well as measures that indicate whether the method is making progress toward achieving the value and vision.

FIGURE 8-5

Salesforce.com’s first V2MOM

Vision

Rapidly create a world-class internet company/site for sales force automation.

Values

1. World-class organization
2. Time to market
3. Functional
4. Usability (Amazon quality)
5. Value-added partnerships

Methods

1. Hire the team.
2. Finalize product specification and technical architecture.
3. Rapidly develop the product specification to beta and production stages.
4. Build partnerships with big e-commerce, content, and hosting companies.
5. Build launch plan.
6. Develop exit strategy: IPO/acquisition.

Obstacles

1. Developers
2. Product manager/business development person

Measures

1. Prototype is state-of-the-art.
2. High-quality functional system.
3. Partnerships are online and integrated.
4. Salesforce.com is regarded as leader and visionary.
5. We are all rich.

Source: Marc Benioff, "How to Create Alignment within Your Company in Order to Succeed," Salesforce.com blog, April 9, 2013.

Then the executive team holds a meeting with the distributed senior management team members (currently about seven hundred people), who provide feedback on the proposed V2MOM in small groups and via Chatter, an internal social networking tool. Leaders are asked for their top five recommendations as well as the top five mistakes in the current V2MOM. Then, after integrating this feedback by making changes to the V2MOM, each member of the senior management team is assigned one method for which she has operational responsibility—and for which she will have measures of success. Finally, the new V2MOM is announced to everyone inside Salesforce.com at the beginning of the fiscal year in early February, and each group is expected to create its own personalized V2MOM that feeds in to the larger V2MOM.

Beyond the specifics of how Salesforce.com constructs a V2MOM, consider the steps of the process at a higher level of abstraction. There is an initial period of *definition* of what to achieve and how to achieve it, followed by several rounds of *feedback,* first with senior managers and then with other managers. Using this feedback, Salesforce.com *adapts* its V2MOM and then *delegates* responsibility for a single method to each individual. Next, it *disseminates* the V2MOM and asks groups to *personalize* the method. Last, the company *measures* its progress and assesses whether it is achieving its goals. Benioff argues that the V2MOM process "works especially well for a fast-paced environment. It is challenging for every company to find a way to maintain a cohesive direction against a backdrop that is constantly changing, but V2MOM is the glue that binds us together."

Amazon.com uses a similar strategic planning process but complements it with a separate loop focused on identifying new ideas that can be used to restart the innovator's method on a new project. During this process in the spring, anyone can propose an idea in the form of a one-page press release, dated in the future, that describes his vision of what he would like to do, complete with fake customer

quotes. These press releases are distributed, and if they garner enough attention, a small team is formed to test and validate the idea using a process similar to the innovator's method. This second loop creates space for Amazon to initiate new projects as it executes and scales the existing businesses.

To construct your own V2MOM, ask yourself the key questions shown in figure 8-6.

FIGURE 8-6

Constructing your own V2MOM

Vision

Where you want to go.

Values

What things are important to you?

Methods

What are you going to do to get there?

Obstacles

What could prevent you from being successful?

Measures

How do you know if you are successful?

The Chasm Awaits

If you forget everything else about this chapter, remember two things. First, the process you used to nail the insight, problem, solution, and business model won't help you scale the business. You need to start incorporating traditional management principles. Second, you can't just flip the switch between entrepreneurial and traditional management. You must slowly blend traditional management in to entrepreneurial management as you scale the market, process, and team. As you go forward, you'll always face some uncertainty. In these situations, you can apply the principles and tools we've discussed to quickly resolve the new uncertainties you face. Finally, even as you scale the business, never stop talking to customers. You may discover an uncertainty—and an opportunity—you've previously overlooked.

Watch Out: Timing Counts

Entrepreneurs typically struggle because they rely on entrepreneurial management for too long, failing to introduce traditional management techniques quickly enough to meet the demands of an ever-growing—and increasingly demanding—customer base. The result: communication snafus, decision-making flaws, and process breakdowns. In contrast, managers in established companies typically have a hard time applying the innovator's method, but once they find a business model that works, they sometimes apply traditional management too quickly, killing entrepreneurial management prematurely. The corporate parent squeezes the life out of a promising new project (often an acquisition), killing the innovation and driving away the innovators.

Neither approach works well, because scaling is not about entrepreneurial or traditional management alone. Rather, it's about blending the two during a transition from the start-up to the growth phase.

9

Making the Innovator's Method Work for You

IN CHAPTER 1 WE explain how Intuit introduced the innovator's method from the top down, with support from the CEO and a sweeping, companywide program aimed at training every employee. Few of us are so lucky. If your top management team does not support or is not aware of the ideas in the innovator's method, what should you do? How can you make these ideas work for you, your team, or your organization?

The answer is to adapt the method to your circumstances, particularly if you're acting alone, leading a team, or trying to ignite innovation in your organization. If you're pursuing more radical innovation versus more incremental innovation, it also calls for special adaptation.

Applying the Innovator's Method on Your Own

What if you work in an environment that may not be conducive to, or may even be hostile to, the innovator's method? Even when companies claim they want to bring new ideas to the marketplace, they may really reward execution, leaving little room for innovation. Or leaders may be averse to making mistakes or simply may not see the need for innovation, even if the world around them is changing rapidly. In these environments, can you apply what you've learned in this book?

Even if you're the only one who has read and believes in the innovator's method, you can apply these principles to transform your career and your life. Remember, the key principles are to identify the uncertainties surrounding an insight and learn about them as quickly as possible in a low-cost, reliable manner. The goal is to turn uncertainties—stated as leap of faith assumptions—into facts. One thing you have in your favor is that most managers hate uncertainty and love facts almost as much as they love saving time and money. You can use these tendencies to your advantage by leveraging the power of questions to sneakily propose a rapid experiment to test a key assumption—but in language acceptable to more traditional management.

For example, as a team member, if someone proposes an idea and you spot uncertainty, you can say, "That's a great idea. What are the key assumptions that must be true for that idea to create value for us? I wonder whether there's a way to run a quick experiment to get some data to validate those assumptions." If you need backup, you can use words like *market test* or *use the scientific method to validate.* These terms sound familiar and palatable to most managers, although you now have a new and different appreciation of them. Or you might refer to a prestigious innovator, such as Amazon.com, and talk about how this company might test the new idea.

The basic formula for introducing the innovator's method to your organization in "stealth mode" has three parts, for which we created the acronym VIP to help you remember the steps.

1. *Value*. We are all naturally defensive of our ideas. To put people at ease, start by showing that you value their idea.
2. *Investigate*. Investigate the proposed idea by asking questions to unearth the leap-of-faith assumptions behind the idea. What must be true for the value to be realized?
3. *Propose*. Propose a way to conduct a rapid experiment to validate the key assumptions; if possible, cloak your suggestion in familiar language. Appeal to the natural desires to save money or time or to avoid embarrassment.

Former students of ours who are managers and executives in established companies have applied the innovator's method but have done it in stealth mode. For example, one former student, Anne (not her real name), had just started working at American Express. In a meeting she attended, a group proposed a new product that would incorporate data and recommendations from customers' social networks to help customers manage their finances and make better spending choices. There were a number of passionate advocates in the room, and they proposed starting product development immediately; they assumed they had sufficient knowledge of customers felt the urgency and of a companywide innovation imperative.

But Anne could see the fallacy of starting product development based on only a guess; however she didn't want to stick her neck out, especially as a new employee. So she applied the method we discussed, handling the new idea with care by first valuing the effort. She recalls saying, "This looks really exciting and could have an incredible impact. I'm so happy to be in a place where new ideas like these are getting discussed." Then she started the second step to investigate, but in the spirit of building on the innovation, by saying, "I know that social is a huge new space with so much possibility, and there is so much to figure out still, and I'm wondering how we could make this project truly amazing by quickly figuring out the key

features that customers really want. I think we have a good idea of what they are, but if we could quickly test those assumptions, we could make this a billion-dollar business."

Then she mixed in an appeal to a prominent company to drive home her idea: "I'm wondering if we could save time and money by doing some rapid, in-the-field experiments to understand exactly what customers are looking for so we can build those features from the start. I know Intuit did a similar thing when they developed QuickBooks Simple Start, living in the field with customers and using the prototype products themselves [an example from class]. They used the data from their field research to create a blockbuster product." Notice that she didn't criticize the project; instead, she subtly suggested a way to quickly run experiments about the key uncertainties. She could let the data from the field reshape or destroy the project.

There was a silence in the room after Anne spoke. She began to get nervous. After what seemed a long pause, a senior manager spoke up, praising Anne's great idea to save time and money on the new project. Several others chimed in, and a colleague came up to her afterward and mentioned how impressed he was with her. Over time, people started to look at Anne with new respect, and some requested her help on new ideas they were considering.

Anne's experience illustrates how you can still apply the principles of the innovator's method even when they're not widely understood or explicitly supported by your organization. Others may not always accept your proposals, but over time, if you suggest experiments to test key assumptions in a positive spirit, you will gain a reputation as a careful thinker.

Moreover, you can apply these same ideas to your own life, thinking through how you might design experiments to test key assumptions about actions you should take. For example, rather than quitting your job to jump into a new career, find a way to be involved in the new occupation for a few hours a month over the course of a year to explore how much you like it. We both did this in making our career decisions as we voluntarily participated in multiple

research projects before jumping from consulting to academia. If you feel you want to change the nature of your relationship with a particular family member or friend, write down your assumptions regarding the key relationship problems, and design an experiment to test an approach for improving the relationship. Whenever you face a problem in life characterized by uncertainty, try deeply investigating the problem, and then consider various experiments to test a solution.

Applying the Innovator's Method in a Team

In 1983, while traveling in the United States with a Toshiba R&D team, Tetsuya Mizoguchi had the idea for the first laptop. Having observed that Japanese workers often lived and worked in small spaces that discouraged the use of large desktop computers, Mizoguchi came to believe that a smaller laptop could become a huge success by allowing computer use at work and at home.

But Toshiba had already tried to enter the mainframe market and failed to beat out IBM. Its personal computer entry also failed, largely because it was not compatible with the IBM and NEC standards that eventually emerged. So when Mizoguchi presented the idea for a laptop to the executive team, he was quickly denied. The executives told him that they were considering exiting the computer business altogether and so did not want to commit funds to new projects. When Mizoguchi continued to push, arguing he could find the funds, the executives claimed that an engineering shortage meant they couldn't divert any engineers to high-risk projects. Despite these denials, sensing the eminent opportunity, Mizoguchi secretly assigned ten engineers to the laptop project at the Ome factory, twenty-five miles from headquarters.

Mizoguchi didn't have the innovator's method framework, but he applied many of the principles to manage the large risks inherent in pioneering a new product category. For example, he designed a five-stage development process that started much as we would have prescribed, first trying to understand the problem by observing computer users as well as dealers and then trying to nail the solution using a series of prototypes. Furthermore, Mizoguchi pushed for rapid iterations toward an awesome product. For example, after several rounds of rapid iteration during which the engineers felt they had reached the limit of what they could fit into a small laptop case, Mizoguchi ripped the cover off the prototype, poured a glass of water into the case, and then held the ruined prototype upside-down. As a

few drops of water fell to the table, Mizoguchi shouted, “See, there is some space left!”[1]

When Mizoguchi’s team finished a prototype that he felt was ready to share with the executive team, they denied him the chance to sell it in Japan. Fortunately, Atsutoshi Nishida, a senior vice president of Toshiba Europe, offered to sell the laptop in his territory—quickly selling thousands of units. With this new evidence, central administration swiftly changed their minds, and the Toshiba laptop was launched worldwide, achieving 38 percent market share in Europe and 46 percent market share in Japan by 1988. Mizoguchi’s story shows that it’s possible to apply rapid experimentation methods on new ideas in your team, even if you don’t have top-level support. But you have to do so with small wins and with supporting data.

Sometimes the bottom-up approach of applying the innovator’s method must be kept secret, particularly for large or controversial projects, as was the case for Mizoguchi. In these circumstances, pursuing a project in secret requires a champion who has enough resources to shelter the project (and a willingness to take risks, such as losing her job). For the laptop project, Mizoguchi had the support of Masaichi Koga, general manager of the computer business division. Later, Mizoguchi repeated this same process, himself sheltering the development of the first notebook computer, a project also rejected by corporate headquarters. Furthermore, these projects must be fast and frugal, being revealed only when there is adequate proof of the concept to convince the rest of the company. In the Toshiba case, the team revealed the project after there was a solid prototype, but perhaps this was too early: the executive team accepted the project only after it had demonstrated sales.

In addition, these projects are often best located away from headquarters to avoid distractions or distortions from the existing way of doing business. Like the Toshiba project, dozens of other secret projects have lived outside corporate headquarters, including IBM’s successful PC experiment, which operated out of Florida, far away from IBM’s New York headquarters.

But you don't need to pursue an innovation as radical as Mizoguchi's laptop in order to apply the innovator's method to the problems your team faces. The key is to educate your team regarding the process and then generate potential innovation insights, picking one or two to test (see "Taking a Page from Agile"). Consider it an experiment to see what you learn. If you're in the middle of a problem-solving or product development process, ask yourself whether you've nailed the problem and you're using fast and frugal experiments to test various solutions with customers. Try to keep whatever you do simple, inexpensive, and focused on learning and action.

Taking a Page from Agile

Some of the best thinking about how to apply the innovator's method as a team comes from the world of software. Because software development teams often face high uncertainty, a number of practitioners (Jeff Sutherland, Ken Schwaber, and Ken Rubin, to name a few) developed the concept of a *scrum* as a better way to organize a team for innovation and development. A scrum, a concept that comes from rugby, is the formation that allows the team to restart after stopping. Several useful ideas from the scrum may help you lead your team.

In software development, every agile scrum team has three components: a product owner, a scrum master, and a development team. The product owner sets the product vision and requirements, the scrum master coaches the team, and the team self-organizes to accomplish the tasks. Beyond software, consider the importance of a scrum master to helping a team apply the innovator's method. The scrum master has several important roles, each one essential: coach, helping the team members learn the method; process leader, helping the team apply the method; change management counselor, helping team members adapt to a new process; and champion, protecting team members from

outside demands and removing barriers. Similarly, as a team member you need to realize your role in self-organizing and applying the process to your work.

Second, every scrum team follows an internal process of defining a *product backlog,* executing a *sprint,* and reviewing the sprint. The product backlog is a list of pending activities prioritized by those most critical to success. The sprint involves planning how the work (experiment) occurs within a short timeframe (between one week and one month), and the sprint review focuses on reviewing the product (completed work in the form of shippable products) and process (how well the sprint worked).

The scrum process has several valuable lessons. For starters, think of your team's backlog as the prioritized list of the most important assumptions you face. The concept of a sprint suggests the importance of identifying the tasks to test those critical questions, time boxing (scheduling) these tasks to go fast, and then adapting quickly as you discover the facts. And scrum teams engage in a daily fifteen-minute review, when they synchronize and adapt their activities to produce a finished outcome at the end of the sprint. After the sprint, the team members assess what worked and what they could have done better.

You could apply the daily process of the scrum to any stage of the innovator's method. As the scrum master, you could coach your team through the definition of a series of sprints to tackle your backlog quickly and effectively, all while learning how to improve the process. For more detail, we recommend Ken Rubin's *Essential Scrum: A Practical Guide to the Most Popular Agile Process* (New York: Addison-Wesley, 2012).

Igniting Innovation from Within Using the Innovator's Method

What if your organization is focused on execution but would like to ignite innovation from within? We recommend applying the innovator's method itself to the problem of building innovation capabilities. Now that you understand the need to develop innovation capabilities, follow the process we have described: assemble a small team, reach out to early adopters inside your company to understand their problems, use prototypes to test your solutions as quickly and inexpensively as possible, and then find the right business model for innovation inside your organization.

Consider how Kate O'Keeffe applied the method to build innovation capabilities at Cisco Services, a major business unit within Cisco employing more than thirteen thousand people and delivering almost one-quarter of Cisco's revenue. Although Cisco Services had made efforts to encourage innovation, for the most part they were ad hoc efforts across a large, diverse, and fragmented organization. So when Joe Pinto, a senior vice president in Cisco's Technical Services group, encouraged O'Keeffe to develop Cisco's innovation capabilities, the project was daunting by every measure. Moreover, she would have to do it without much budget, credibility, or infrastructure. Faced with this challenge, O'Keeffe said, "I needed to start small, demonstrate proof points, and earn organizational support organically."[2]

O'Keeffe began by assembling a small team composed of T-shaped people (people with breadth across many disciplines and depth in some disciplines) who were passionate about innovation and willing to voluntarily help her test their assumptions about igniting innovation. Included were an experienced facilitator, a serial entrepreneur, an expert in organizational behavior, and an expert in six sigma and product management. The team called itself the Services Innovation Center to create early legitimacy and connect to influential parts of the organization, for example, engaging

executives such as Carlos Pignataro, a Cisco Distinguished Engineer who brought the members of that community with him.

Then, much as we have described, the team set about understanding the job-to-be-done. To do so, the team reached out to early adopters (people inside the company who wanted more innovation) to understand the problems they were trying to solve. O'Keeffe described this process: "We have a really different model. It's a client (customer) model, meaning we define what we do around what our customers (managers and executives) need to innovate."[3] As part of the process, the Services Innovation team discovered that different customers wanted different things. Some wanted help generating new insights, others wanted help assessing and developing their innovation capabilities, and still others needed experimentation tools and instructions for how to innovate.

With a clearer picture of the job-to-be-done, O'Keeffe and her team could start to prototype solutions for a focused set of customers. Rather than wasting resources building full-featured solutions to every problem at once, O'Keeffe and her team prototyped solutions one at a time. For example, in one early effort the Services Innovation team developed a rapid prototype of an idea day and an idea tea time that spread virally throughout the company.

In a later example, several senior leaders expressed a desire to explore new business models and markets for existing technologies (the functional job) while also inspiring employees to innovate (emotional job). With these "jobs" in mind, the Services Innovation team prototyped a potential solution: a "LaunchPad" event that they pitched to Parvesh Seth, the senior vice president of Advanced Services, who agreed to conduct a pilot program. With this validation from an internal customer (similar to a payment test with an external customer), the Center assembled teams of six people from across the Cisco Services businesses, grouped around nine global regions. Each team worked to generate insights, explore the job-to-be-done with customers, and then rapidly prototype potential solutions. Then the teams converged in front of a combined live and virtual audience of senior executives to describe the problem and their most promising prototype. Although a rapid experiment, the LaunchPad

proved a success, creating a $9 million impact and inspiring the excitement executives were searching for. In the words of Rosette Nguyen, one participant, “This was an incredible experience—what we learned from the process, the networks we built, and the exposure we received was incredible. I have everything I need to drive greater innovation in the future.”[4] But just as important, it also led to innovation: the winning team developed a services dashboard for health care that one customer literally begged to buy or invest in.

By rapidly iterating on solutions for internal customer problems, the Services Innovation team generated the proof that they could solve key innovation problems inside the company. Over time, they have iterated from rapid prototypes to more feature-rich solutions, such as an innovation capabilities assessment and tools to capture and develop ideas. In another example, the team started without an idea capture tool, then adopted a version developed by Brightidea, then rapidly iterated to develop a tool that allows crowd-sourcing ideas across the entire services division. They have leveraged the platform, called Smartzone, to capture, select, nurture, and develop ideas.

For example, O’Keeffe recalls a team of service engineers who were discussing the daily challenge of trying to get customers’ technical issues solved faster. The core issue was access to pieces of code, called scripts, which enable a customer issue to be resolved. Trying to find these scripts could be time-consuming and often delayed resolution of the customer issue. The engineers came up with an idea that would be like an app store for service engineers. This solution, a social networking platform that quickly connected service engineers to the required scripts, had the potential to change the way service engineers performed their work. The team, led by Sam Grimée, a senior manager in Technical Services, immediately submitted it to Smartzone, which attracted the feedback, interest, resources, and sponsorship needed to move through the steps of the innovator’s method and bring the innovation to the service engineers. Grimée recalls, “Smartzone was a great medium to test whether potential customers found our idea useful, and it helped us identify and build a network of stakeholders to engage with and later

partner with. The exposure and feedback we received were instrumental to define our plans and guide our solution development.” They generated enough enthusiasm and funding to make a viable demo, a prototype, and to secure the people needed to help them succeed internally. The result is more than six thousand scripts being made available on a social media platform inside Cisco Services, each one saving precious minutes or hours of engineering time.

Finally, as the Services Innovation team prototyped and deployed solutions, they also experimented to validate the business model. For example, as with the launch of any other innovation, O’Keeffe’s team had to find a way to deliver a value proposition, acquire customers, and manage costs. Recall that customer acquisition requires understanding what motivates your customers (the job-to-be-done), how they make decisions (the consumption chain), and how to communicate through channels that influence them (the influence pyramid). The team started by understanding the unique job-to-be-done for different customers; for example, junior engineers are looking for time and recognition, whereas senior executives are looking for big ideas that will create value through engaged employees. The team also looked at the consumption chain—the points at which innovation messages can influence their customers, such as company communications, annual evaluations, high-profile events, compensation, and so on. Finally, the team tackled the influence pyramid for their customers. For example, even though newsletters and e-mails have some effect, the team discovered that a range of events, such as an Innovation Summit (for advocates) and an Innovation Leadership Forum (a speaker series), along with rewards (a $1,500 Innovation Catalyst Award), had an even greater effect. Similarly, when it comes to costs, the team thought carefully about leveraging the resources already in Cisco, using partners inside and outside Cisco to develop and deliver solutions.

By applying the innovator’s method, O’Keeffe and her team have been successful in igniting innovation within Cisco Services. In the last quarter alone, they’ve generated dozens of insights and more than $12 million of business impact, including lifting employee

innovation engagement scores by more than 8 percent in the teams they engaged.[5] Moreover, people feel energized and inspired, saying things like, “I have never felt so much like a part of Cisco” and “People who were originally skeptics are now genuinely excited.”[6] Having nailed the problem, solution, and business model, the team now faces many of the challenges described in chapter 8: developing the whole-product solution, standardizing the solution, and finding ways to deliver it at scale.

Adjusting for Disruptive versus Incremental Innovation

Imagine you work at Google and you're asked to work on bringing a new solution to market. You've been given two projects to choose from: Google Offers, an idea for a service offering discounts and coupons that is integrated with both Google Wallet (for payment) and Google Maps (to identify the location of the offering company), or Google Glass, an idea for a wearable computer with an optical head-mounted display (OHMD) that responds to voice commands and displays information in a smart phone-like hands-free format.[7] Both projects involve trying to bring something new to market, but clearly the Google Glass project involves a more radical innovation with higher uncertainties and higher risk. How might applying the innovator's method be different for an incremental versus a more radical, disruptive innovation (see "What Is a Disruptive Innovation?")?

What Is a Disruptive Innovation?

Innovations fall into two general categories: incremental and disruptive (radical). An *incremental* innovation builds on a firm's established knowledge base and either improves a product or offers product line extensions—for example, a Gillette razor with five blades instead of four; a Samsung TV with 3-D instead of 2-D imaging; and improvements to internal operations to accomplish a task faster, better, or with fewer resources.

In contrast, a *disruptive* innovation draws on a different knowledge base, technologies, or methods to deliver value in a unique way. Examples of disruptive product innovations include digital watches (versus mechanical watches), the personal computer (versus the typewriter and manual

processes), cell phones (versus landline phones), and MP3 players (versus CD players).

Processes can also be changed in a disruptive way. For example, Toyota engineer Taiichi Ohno's flexible production techniques, often referred to as *lean* manufacturing, minimized inventories and waste despite being designed for rapid product changeovers. Business models, too, can be based on radical innovations. For example, Netflix used the internet, software, and warehouses to deliver video rentals through the mail and through streaming, an approach that was radically different from the brick-and-mortar stores of one-time market leader Blockbuster. Similarly, Redbox rents videos through vending machines, a method that requires different technologies—and a different distribution system—from those used by either Blockbuster or Netflix.

Strategies based on radical innovations are sometimes referred to as *disruptive* (a term popularized by Clayton Christensen) because incumbents can no longer do business as usual.[8] For example, Netflix and Redbox disrupted Blockbuster's strategy. Disruptive innovations often stem from a new technology entering at the low end—the most price-sensitive segment of the market—and then gradually moving upmarket as the disrupting company improves its technology and processes.

Although the Google Glass project may seem "cooler" because it's more disruptive, these types of innovations present significant challenges. Indeed, *The Innovator's Dilemma* argues that managers who aren't trained to deal with disruptive innovations fail when they try to apply their familiar tools for incremental management.[9] In the parlance of the innovator's method, we see the difference between incremental and disruptive innovations in terms of degrees of uncertainty. Disruptive innovations involve much greater uncertainty—sometimes orders of magnitude greater. This means that you'll need to apply the innovator's method to almost everything you do.

But for disruptive innovations you must also adjust your expectations along four key dimensions: target customers, feedback expectations, timeline, and structure.

Before we describe these dimensions, we want to acknowledge that incremental innovations can also have significant benefits. By some estimates, they create as much value for companies as do disruptive innovations. For example, Hindustan Unilever discovered and implemented many small incremental innovations, generating a 40 percent revenue boost in a single year. With incremental innovations you enjoy lower uncertainty, you may already possess many of the required resources, and you can more easily integrate the change with your existing business model. However, it is also crucial to recognize that disruptive innovations create the growth markets of the future and so are a fundamental part of a firm’s innovation portfolio.

Adjust Your Feedback Expectations

Most disruptive innovations are adopted first by nonusers: people who are not well served by existing solutions. Therefore, as a first rule of thumb, if you are pursuing a disruptive innovation, you should always explore your innovation with nonusers in great depth. That being said, regardless of whether you explore a disruptive innovation with users or nonusers, there are some peculiarities of the adoption process you should watch out for.

First, for disruptive innovations, customers may not fully recognize the problem, or the solution may be unfamiliar. As a result, you may receive negative feedback at first. Furthermore, for many disruptive innovations, people cannot imagine the product until they actually try it. For example, when Reebok introduced the Reebok Pump—an athletic shoe that has a button to inflate air pockets around the ankle—basketball players and coaches were skeptical until they tried the shoe. Then they loved it. *The Innovator's Dilemma* calls this the "agnostic marketing" problem, meaning that, for disruptive innovations, no one—not experts, not traditional market research, and not even customers themselves—can tell you what is wanted or whether it will succeed. Instead, customers have to try it to fully appreciate it.[10]

To complicate matters, there may be social norms or incentives that distort the feedback you receive. One entrepreneur developed a portable X-ray machine that produced such clear images that any health care provider could see bone cracks or tissue lumps, at 10 percent of the cost of existing technology. But radiologists and medical device companies were not interested. Why? The new machine conflicted with their existing financial incentives (radiologists interpret fuzzy films, and medical device companies sell expensive machines). Ultimately the company failed because it ran out of cash before it could overcome these persistent obstacles.

Similarly, if a solution doesn't seem legitimate, customers may reject it no matter how well it solves the problem. In one famous example, efforts to teach villagers to boil unclean water in the region

of Los Molinos, Peru, failed because of a local tradition that hot foods were only for sick people. Because the innovation was only adopted by people lacking legitimacy (social outsiders), the practice failed to spread.[11] If your innovation faces potential legitimacy challenges, you may have to think carefully about how to create that legitimacy.

Adjust Your Timeline

In the popular lore surrounding disruptive innovation, incumbents are blindsided and respond too late, leading to their failure. For example, Swiss watchmakers dominated the mechanical watch industry for years before digital watches—most of them made by Japanese firms—entered the market. The Swiss viewed these new watches as low-quality, low-margin timepieces; jewelers did not want to sell them, and Swiss watchmakers felt certain they could maintain their advantage. But as the performance of digital watches improved, they began to move upmarket, quickly replacing Swiss watches at the market's lower end and then in the mainstream. By the time Swiss manufacturers responded, it was too late. Japanese manufacturers were making millions of units for every ten thousand units the Swiss produced. Within a decade, the Swiss watch industry had been decimated, with most manufacturers going out of business and the Swiss market share falling to less than 10 percent.[12]

On the surface, the Swiss watch example appears to be a classic case of disruption, with the incumbents being blindsided by a new technology. But let's take a closer look. In this case, as in other disruptions, the incumbents actually invested early on in digital technology, but they concluded it was too expensive and too clunky and would never succeed against the elegant Swiss watches. As a result, they simply quit investing.

The issue at stake is a matter of timing and perception. Early in the life of a disruptive innovation, it often appears "not good enough." Moreover, market adoption of disruptive innovations takes far more time than with incremental innovations. In some cases it might take decades for the disruptive product to improve to the point where customers will accept it. This means that if you're working on the Google Glass project instead of the Google Offers project, you'll need to be patient and adjust your expectations for how quickly the product will gain adoption and be seen as valuable. Moreover, you may have to patiently improve certain new technologies (or work with partners to improve them) for the disruptive product to nail the job-to-

be-done. It usually takes longer to get market adoption, because customers will be unfamiliar with the solution and will need to be educated. If you've adopted a low-cost, high-experimentation approach like the one we advocate—rather than the high-profile, high-cost approach taken by many hopeful innovators—you're more likely to sustain the organizational patience needed for the idea to mature.

Adjust Your Structure

It's critical to provide the right structure—and the right mix of skills—for disruptive innovation project teams. Many organizations fail with projects, especially disruptive ones, because they fail to understand a basic organizing principle: the more radical the idea, the more autonomy the project team will require.

Let's see why that is. A company's least radical projects typically involve incremental improvements to existing products. For example, at Sony the next generation of its PS4 game console (we'll call it the PS5) will likely be developed by designers and engineers who work at Sony and are familiar with the PS4's components and architecture. Innovations are likely to come from modifying or improving existing components (graphics, storage, the convenience of online gaming) or perhaps adding a new one (perhaps the ability to digitally record TV shows as a DVR or TiVo does). The ideal team for this project is a team of engineers who specialize in each type of component, working at the component level. Alternatively, Sony might use a *lightweight* team—mainly people from the game console group but including a few engineers from other functional areas.

But imagine that Sony wants to develop a Google Glass–like device that possesses features that leapfrog Google Glass (let's call it Sony Glass) and support advanced gaming. If Sony attempts to develop the new Sony Glass device within the PS4 engineering group, the new device will likely reflect the knowledge and technology of a Sony game console. The same would be true if the device were developed by the Sony computer engineering group, or the Sony TV group. To get something more radical, Sony would be better off pulling folks from each of these areas (and perhaps elsewhere) into an autonomous project team, independent and isolated from the rest of the corporation, to protect the innovation and allow full application of these principles.

A project may differ so radically from a company's offerings that it requires a different business model (e.g., to serve different customers using different technologies). In these cases it makes

sense to create a fully autonomous business unit. For example, when Amazon decided to pursue, and then launch, a cloud computing service business (Amazon Web Services), it created an autonomous business unit, because the opportunity demanded a different business model from Amazon's online retailing business.

Creating an autonomous team or business unit can be critical for several reasons. First, when the existing business model conflicts with the disruptive business model, staying with the existing business model can destroy the disruptive idea. The existing business model will starve the idea of resources, as happened in the Swiss watch case, or it will kill the innovation outright, as occurred when Polaroid shelved its market-leading digital capabilities because they conflicted with its film-based business model.

Second, large companies require growth that disruptive innovations initially cannot provide. A billion-dollar company searching for 10 percent growth ($100 million) next year will find the $50,000 revenues of an early disruptive innovation irrelevant. As a result it will either defund the effort or distort it by trying to make it generate revenue right away (usually it gets turned into a sustaining innovation that misses the market opportunity). Putting the disruptive idea into a separate group that can get excited about smaller revenues will let these folks take the steps to one day build a billion-dollar business.

Third, putting the disruptive idea into a separate unit lets the team develop the resources the innovation needs rather than those already in the firm. For example, when IBM sent a team to Florida to develop the IBM PC, the team developed new competencies and used the resources of new partners, such as Intel and Microsoft. This strategy saved the team crucial time and expense, economies that proved vital to the success of the IBM PC.

Watch Out: Are You Dependent on Someone Else?"

Have you ever wondered how Nokia went from being the top phone manufacturer in the 1990s, only to be banished to the sidelines in the smart phone era? It's tempting to think the company didn't try to innovate or didn't foresee the 3G revolution, with its potential for mobile internet and a portable, digital lifestyle. But that's not it. As Ron Adner recounts in *The Wide Lens,* Nokia was an enthusiastic pioneer of the 3G era.[13] Projecting that there would be more than 300 million 3G users by 2002, Nokia pushed the development of the first 3G phone, the 6650, which was the most technically advanced mobile phone to date. Despite successfully producing the first 3G phone at an affordable price—an immense technical feat in 2002—Nokia saw less than 1 percent of the predicted market materialize.

Although Nokia delivered a solution, it overlooked a change that occurred in the transition from 2G to 3G: successful innovation shifted from being an independent effort under Nokia's control to an interdependent effort, much of it outside Nokia's control. The shift to 3G required the development of outside innovations such as video conversion software to display mobile video, changes in router technology to handle increased traffic, database tools to allow mobile operators to identify users' data access, digital rights management to ensure security for content providers, and so on. As a result, when Nokia delivered the phone, the remaining pieces of the ecosystem were still missing. Nokia failed to recognize that its success was dependent on others, and it hadn't properly addressed or managed those interdependencies.

Increasingly, innovation is shifting from independent to interdependent undertakings. Multiple partners must deploy their resources and even change their activities to ensure widespread market adoption. Some of these partners may be upstream or downstream, in areas that you might normally ignore.

To adapt the innovator's method to interdependent innovation, start by mapping the required ecosystem for your

product. As you look at the uncertainties you face, look upstream at any uncertainties about the required components, downstream at the uncertainties of adoption, and laterally at the larger ecosystem of partners you need. What parties possess complementary assets or resources that will influence the successful adoption of your innovation? Once you've identified them, it's critical to bring them on board early. Otherwise you might spend significant time and resources developing an innovation that will not succeed because you did not get the support of entities that possess key complementary assets.

Adapt to Innovate

Your ability to apply the innovator's method depends on your circumstances. If you're an individual contributor, your pathway will differ from that of a team leader or an organization leader trying to achieve organization-wide impact. We've observed the successful application of elements of the method by hundreds of individuals and by dozens of companies, large and small. In most instances, managers and entrepreneurs adapted the method to fit their own circumstances. There is no one-size-fits-all prescription for success.

Despite the adaptations, there remains remarkable adherence to the basic principles: identify a problem, identify the necessary assumptions with regard to solving it, construct low-cost experiments to test your assumptions, and learn as quickly as possible. We know you can adapt the innovator's method to your unique circumstances.

In conclusion, we want to once more acknowledge that the innovation process is inherently messy and recursive. We have tried to simplify the process here to make it easier to understand, but in reality, stages overlap with one another, some steps get skipped, and often confusion or ambiguity accompanies the process. When this is the case, it helps to recognize that you aren't doing anything wrong. Rather, you are dealing with uncertainty and such messiness is part of the process. Rather than trying to stamp out uncertainty, respect and embrace it as many great things emerge from uncertainty: creativity and innovation are just one.

Conclusion

Turn Uncertainty into Opportunity

IN THE FIRST DECADES of the US biotechnology industry, most biotech companies operated according to the same rule: identify one promising candidate drug (usually following up on an insight coming from academia), and then focus virtually all your resources on bringing this drug to market. Because the cost and technical uncertainty in discovering and developing new drugs were so high, the prevailing wisdom argued that nascent biotech companies had neither the capital nor the know-how to develop a broader research base or drug pipeline. Furthermore, diluting efforts by attempting to do so was a sure recipe for failure. While many young companies raised tens to hundreds of millions of dollars to develop a single new drug, the sad truth was that the vast majority of these companies would fail, never bringing a single drug to market. The landmark sequencing of the human genome raised hopes that things would change: thousands of cures for cancer and other diseases would become instantly obvious, and the rate of drug discovery would exponentially increase. Unfortunately, things didn't change. Despite the efforts of hundreds of biotech companies, not to mention dozens of so-called multinational big pharma companies, each year only about twenty new drugs are approved in the United States, and very few are true blockbusters that change the landscape.

So when a newly formed biotech company called Regeneron, led by physician-scientists Leonard Schleifer and George Yancopoulos, held its first meeting with a board of esteemed scientific advisers, the team members were excited to share their grand vision of a better

process for developing new therapeutics. Rather than focus on one solution, Yancopoulos proposed that they first invest in better understanding why treatments failed in the first place and then use better experiments to create dozens of solutions at the same time. This would require creating tools to tackle the rate-limiting factors—the accuracy and speed of experiments—in developing new therapeutics.

Much to the chagrin of Yancopoulos, formerly a professor at Columbia, the room exploded with criticism: What were Schleifer and Yancopoulos thinking? Why weren't they, like everyone else, focusing their research efforts and resources on a single high-potential therapeutic treatment? How could they possibly succeed if they scattered their resources and attention by testing multiple solutions at once?

Yancopoulos recalls being stunned and dismayed. Finally, Schleifer stepped in, asserting that Regeneron was going to try its process in spite of the advisers' rejection. Although Yancopoulos felt relieved to have Schleifer on his side, we ask you to put yourself in their shoes: some of the most preeminent thinkers in the world had told them they were going about it all wrong. Were they?

Fast-forward twenty-five years, and we find that Regeneron is one of the most innovative companies in the world. Regeneron's success in developing breakthroughs has helped it rise rapidly to the number 4 position on the *Forbes* most innovative companies list, with an innovation premium of 63 percent. Although Yancopoulos could easily look back and gloat, he says he now recognizes how fortunate the founders were. Most companies that followed the advice of their advisers failed, flaming out before they brought a single product to market. As it turned out, many of Regeneron's early guesses, although seemingly founded on strong science, also turned out to be dead ends. Had Regeneron focused too narrowly, it too might have become a forgotten failure.

At the core, a single insight differentiated Regeneron from its contemporaries: in a highly uncertain environment, you need to do fast and frugal experiments to solve problems. Whereas many of Regeneron's contemporaries unwittingly borrowed traditional

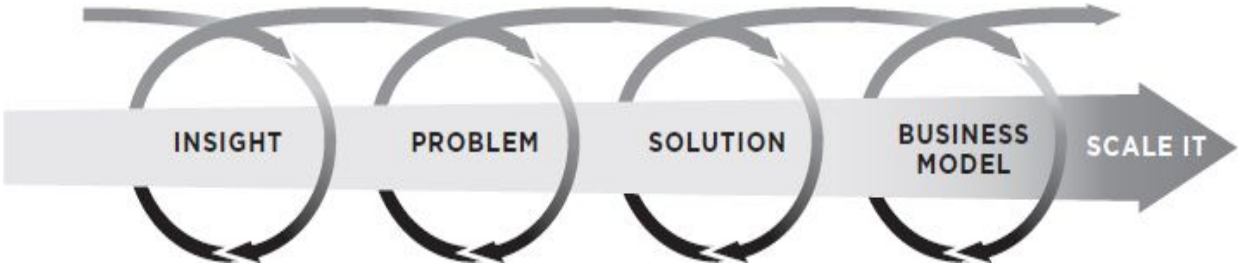
management tactics from established pharmaceutical firms (which faced comparatively greater certainty), Regeneron started with the assumption that it faced unprecedented uncertainty. Yancopoulos says that even though many of Regeneron's contemporaries have a healthy respect for peer-reviewed science, he started with a healthy disrespect. "In my view 60 to 90 percent of discoveries in biology are either wrong or irrelevant," he says. "Just take a look at the *New York Times* science section: Of a hundred breakthroughs, how many have materialized? I remember seeing the cover of the *New York Times* in 1998 that cancer would be cured in two years . . . the point is, most of what we believe to be facts are not."[1]

Because they recognized such fundamental uncertainty, the Regeneron team designed a different process to deal with such uncertainty. As Yancopoulos recalls, "Our core belief was that if you don't know for sure about things, you are going to make a lot of wrong turns, wasting a lot of resources. Our belief was that we could actually use genetics as the most powerful way to rigorously test an idea. We are doing something fundamentally different than the way a lot of companies innovate."[2]

Although the two men describe this process in more scientific terms, in essence, the Regeneron team discovered and applied the innovator's method (see figure C-1).

FIGURE C-1

The innovator's method



Here's how. In the first step—insight—we recommend searching broadly rather than focusing on a narrow set of ideas. Regeneron searches much more broadly for insights than most biotechnology companies before settling on the problems it wants to tackle. Whereas many biotech companies are based on a single insight from a scientist's lab, the Regeneron team members go beyond the lab, scouring the broader academic literature, searching for potential associations or even hints of associations between genes and a disease. Then, when they find a reported association, the team does experiments in genetically modified mice, created using its VelociGene platform technology, to test it. In this way, the Regeneron team can generate and validate insights, using real data, much more quickly than many competitors. Yancopoulos argues, "Using this approach we could re-create reported associations and quickly jump on them. Instead of following the literature, we can sample a thousand associations and jump on the most promising ten to fifty."[3]

For example, in the mid 2000s, Regeneron teams became aware that researchers at the University of Texas had found a specific genetic mutation in people who have "bad" (LDL) cholesterol levels that are 20 percent as high as those of the rest of the population (and who have correspondingly lower rates of heart disease). Putting VelociGene to work, Regeneron scientists quickly created this mutation in their mice and watched the effect, quickly observing and validating an insight—an association between a specific gene, a biochemical marker (low "bad" cholesterol), and heart disease. Today, Regeneron and its big pharma partner, Sanofi, are completing phase three trials with the drug they went on to develop, while other pharmaceutical giants are in hot pursuit in this next generation of cholesterol-lowering drugs.

The second step of the innovator's method is to deeply understand the problem. Perhaps because life science companies face greater technical uncertainty (will it work?) than demand uncertainty (will customers buy it?), most companies start by focusing on solutions. But as Yancopoulos notes, "If you are so focused on the solution, and things aren't working, and you are trying to get things to work, you don't understand the reasons you are failing . . . Rather than slapping

solutions on top, we were trying to deeply understand the problem, which is the first step."[4]

Regeneron doesn't interview customers, because most customers care about problems like curing their cancer or lowering their blood pressure (the demand uncertainty). But Regeneron still invests in understanding the physiological and biological problem before working on the solution. For example, before developing solutions to block the way disease-related genes instruct the body to bind proteins with one another, the Regeneron researchers experimented to understand how the relevant proteins bind with each other in the first place so that they could better create solutions to block the binding process. Because Regeneron focused on the problem first, says Yancopolous, "we were able to come up with a therapeutic solution better than anyone else's solution . . . in fact, whereas most companies would develop only one drug for a particular target, by understanding that first step really well, we ultimately came up with three drugs and five disease applications."[5]

The third step of the innovator's method is to iteratively match a solution to the problem using a series of prototypes to avoid wasting resources on unwanted solutions. Of course, all life science companies test their solutions to make sure they work. But they often use a long, expensive testing process that starts with testing in animals and then progresses through three rounds of clinical trials in humans, ultimately costing hundreds of millions of dollars and resulting in failure rates as great as 97 percent.[6] Many companies have tried to overcome this liability by pushing as many solutions as possible through the clinical trial pipeline in hopes of increasing their hit rate, resulting in a sharp increase in the cost to develop new treatments.

Clearly some of the prototypes we have recommended, such as virtual prototypes drawn in PowerPoint, would not work here. But consider how Regeneron has applied the principle. Rather than push solutions into clinical trials, Regeneron executives adopted the idea of early, rapid experimentation, developing a technology that would allow them to rapidly generate and test many solutions more accurately in that first step of animal trials. Most companies test one

or a few solutions in mice. Mice are inexpensive but are imperfect models for human disease. Rather than accept the status quo and rely on an imperfect experiment with a small number of solutions, Regeneron redesigned the experimentation process, creating a technology to generate a larger number of higher-quality solutions by replacing mouse immune genes with human counterparts, but at a scale millions of times larger than any gene replacement attempted previously. These “humanized” mice were then used to develop what was effectively a multitude of “prototyped” solutions that were also more specific to human disease: human antibodies, rather than mice antibodies, to treat a disease. A different humanized mouse would then be used to quickly test which of the prototyped solutions actually worked to treat the disease, in what was essentially a prototype of a human model. Whereas their closest competitors could test one or two mouse antibodies (which are imperfect models of human antibodies), the Regeneron approach lets the company prototype and then test hundreds of human, rather than mouse, antibody solutions. Not only did Regeneron experiment during the earliest stage to find the best solutions, but it also invented a technology that allowed it to experiment better and faster—a hundred times faster.

As we look back, part of what makes Regeneron successful is that it has applied the principles of the innovator’s method to test unknowns more quickly and more effectively than most competitors. It has made mistakes, but applying rapid experimentation has allowed it to quickly test multiple solutions, thereby enabling it to rapidly resolve some of the huge uncertainties during treatment development. This approach has helped Regeneron successfully develop for approval three treatments in the past few years, a remarkable achievement for all but the largest pharmaceutical firms.

EYLEA, the most successful so far, treats a form of adult vision loss known as wet age-related macular degeneration. The product achieved nearly $1 billion in sales during its first full year, a rare feat in a field that rarely sees blockbuster treatments. What’s more, Regeneron produces these breakthroughs at a cost dramatically lower than the industry average: according to a recent analysis, most companies that have produced three or more approved treatments spend an average of $4.3 billion in R&D per treatment. Some of the

larger companies have spent as much as $10 billion. By contrast, Regeneron has spent an average of $736 million per treatment, a number that includes both the cost of development and the extra investment in experimentation tools.[7]

Innovate on the Method Itself

Beyond its remarkable application of the innovator's method in an industry characterized by complex science and high technical uncertainty, Regeneron's experience teaches us a deeper lesson. The company has been so successful because it innovated on the process itself. It identified the rate-limiting elements of its ability to nail the problem and solution and then developed innovations that dramatically increased the speed at which the company could follow the steps. As Yancopoulos describes it, "We went broad, beyond the technology, to come up with tools that would allow us to make better choices in the first place."[8]

These tools include data sets to test insights, the technology to replace genes (VelociGene), the tool to create human antibodies in mice (VelocImmune), and a number of other approaches. These process improvements allow Regeneron to test problems and solutions more quickly, inexpensively, and accurately than competitors. "History is proving that our approach was better," says Yancopoulos. "We've been able to come up with faster, better ways to make those crucial decisions: How do you pick the right problem and how do you know if your solution will really work."[9]

Gain a Competitive Advantage

As uncertainty increases, companies will have to reorganize for innovation, adopting new ways to effectively create new products, services, and solutions. But rather than view such a change as a threat, leaders should view it as an opportunity to create an advantage by designing better experimentation tools to speed innovation.

At the beginning of this book we argue that you should ignore strategic issues such as competitive advantage or first-mover advantage until you determine that you've found a problem worth solving and a solution that nails the job-to-be-done. As professors of strategy and innovation, we're being fairly heretical in advising you to ignore strategy during the first stages of the method (of course, strategy matters as you begin to nail the solution). But ask yourself, in an era of uncertainty, what competitive advantages truly persist? As we show in chapter 1, competitive advantages are more fleeting than ever. We argue that in high uncertainty, the only durable advantage is the ability to manage uncertainty: to capture opportunities more quickly and to learn more effectively than competitors, and to bring those innovations to market. Although it takes time to develop and practice this capability, once developed, it's hard to imitate. That makes it durable.

By applying the innovator's method to the problems of increasing the speed and effectiveness of experimentation, Regeneron has created a competitive advantage. Although the company has been criticized for working in diseases crowded with competitors, Yancopoulos and Schleifer make these seemingly counterintuitive choices because they believe they can learn—and develop effective solutions—more quickly than others. Using its rapid experimentation processes, Regeneron can test assumptions so quickly that often it simultaneously tests its competitor's solutions as well as its own as it looks for opportunities to leapfrog a competitor. Whether it can continue to develop these capabilities and stay a step ahead remains to be seen. But its remarkably high hit rate and low development

costs suggest that it has developed a durable advantage through its innovation capabilities.

Professional and Personal

We start this book by asserting that as we move from the industrial age to the information age, we face a surge in uncertainty that calls for a new way of management. Established companies will no longer be able to rely on traditional management alone if they hope to innovate or survive. Instead, managers and entrepreneurs alike will have to apply the new management science of innovation—what we labeled the i-school—to the uncertainty of creating new growth from innovation.

Each major discipline, upon encountering uncertainty, has developed its own answer to the challenge of how to manage uncertainty. Each perspective offers valuable insight into solving high-uncertainty problems. Each perspective has generated thoughtful contributions. But rarely do the holders of these perspectives talk to each other or consider how their overlapping approaches could be combined to effectively address the need for innovation.

In this book, we've tried to synthesize these perspectives into a single method, an end-to-end process that you, your team, or your company can use to generate disruptive insights and bring them to market. In a sample of companies we studied, we found a significant correlation between implementing elements of the innovator's method and an increase in innovation premium and market value. Indeed, the average boost in innovation premium is more than 50 percent, an increase that translates into billions of dollars in market capitalization. Similarly, companies that have instituted these ideas, even after trying to innovate using other approaches, have claimed significant increases in revenues from new products: for example, both Intuit and Cisco Services earned more than $100 million in new revenues, and Hindustan Unilever enjoyed a 40 percent increase in revenues.

But more important than shorter-term revenues and market value, these companies discover new opportunities and bring them to market at lower cost and at higher success rates than their competitors. Regeneron is not alone in saying, "We've been able to come up with faster, better ways to make those crucial decisions";[10]

Jeff Bezos cites a reduction of the costs of experimenting and a resulting boost in the number of experiments the company is able to conduct.[11] For Intuit founder Scott Cook, the approaches described here have “totally transformed” the way the company operates. Our firsthand research showed that every Intuit leader, manager, designer, and engineering lead used the process of developing a hypothesis, framing an experiment, and then using the data to make decisions.

This approach has allowed companies working in a wide range of industries, from software to cement, from pharmaceuticals to food products, to discover the tools to innovate repeatedly. Those that apply the method are finding the returns speak for themselves. “Our innovation program sharpens the focus of our employees and our ecosystem on the direction we’re going,” says John Donovan of AT&T technology and network operations. “But it also is providing elite venture capital returns, so there’s real value in it.”[12]

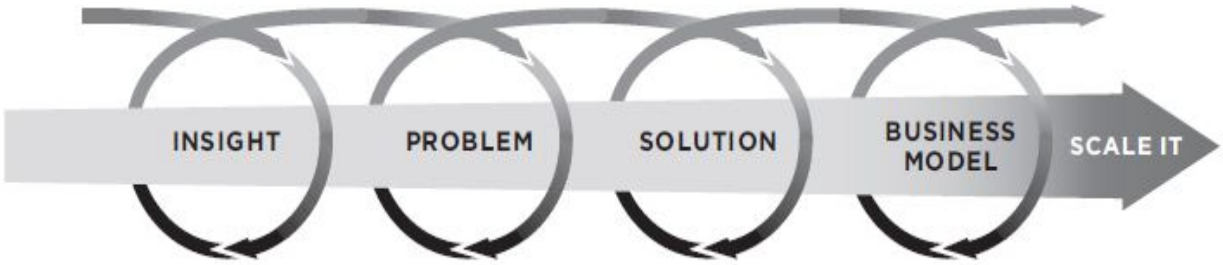
Whether you’re a leader, a manager, an entrepreneur, or an individual contributor, we know you can apply this method to resolve uncertainty, wherever you face it, whether in internal processes or external innovations, at lower cost and with greater success than ever before. The innovator’s method will help you creatively solve problems that you face in both your professional and your personal life. Most of all, you can use these tools to learn more quickly than others—and in this era of uncertainty, speed of learning is the new competitive advantage. We look forward to seeing you use these tools to cross each new finish line first, wherever that may be.

Appendix

An Overview of the Innovator's Method

IN THE FOLLOWING figure A-1, we summarize all the steps and tools of the innovator's method. This graphic features the key activities for each step of the innovator's method, the tools, and the tests to know whether you have resolved the key uncertainties of each element sufficiently to have confidence in your innovation. Additional insights on how to apply these, and other tools and tests, are available at www.theinnovatorsmethod.com.

FIGURE A-1



KEY ACTIVITIES	Savor Surprises	Discover Job-to-Be-Done	Prototype Minimum Awesome Product	Validate Go-to-Market Strategy	KEY ACTIVITIES
TOOLS	5 Discovery Skills Insight Capture System	Pain-storm Ethnography Advice Interview	Solution-storm Four Prototypes	Price Sensitivity Meter Consumption Chain Customer Influence Pyramid	TOOLS
TESTS	Vote Test Proof Test	Cold Call Test Smoke Test	Wow Test Promoter Test Payment Test	Love Metrics Financial Metrics	TESTS
OUTCOME	Opportunity Insight	Customer Vision Statement	Minimum Awesome Product	Scalable Business Model	OUTCOME

Notes

Introduction

1. Thomas Eisenmann and Laura Winig, “Rent the Runway,” Case 812-077 (Boston: Harvard Business School, 2012).

2. Ibid.

3. Ibid.

4. Ibid.

5. Jenna Wortham, “A Netflix Model for Haute Couture,” *New York Times*, November 8, 2009, http://www.nytimes.com/2009/11/09/technology/09runway.html?_r=0.

6. See http://sloanreview.mit.edu/article/rent-the-runway-organizing-around-analytics/.

7. Evidence suggests that writing business plans has no correlation with success under conditions of uncertainty and are largely a waste of time. See John C. Dencker, Marc Gruber, and Sonali K. Shah, “Pre-Entry Knowledge, Learning, and the Survival of New Firms,” *Organization Science* 20, no. 3 (2009): 516–537; David A. Kirsch, Brent Goldfarb, and Azi Gera, “Form or Substance? The Role of Business Plans in Venture Capital Funding,” *Strategic Management Journal* 30, no. 5 (2009): 487–515; Julian E. Lange et al., “Pre-Startup Formal Business Plans and Post-Startup Performance: A Study of 116 New Ventures,” *Venture Capital* 9 (2007): 237–256.

8. Clayton M. Christensen, *The Innovator’s Dilemma: When New Technologies Cause Great Firms to Fail* (Boston: Harvard Business Review Press, 2013); Jeff Dyer, Hal Gregersen, and Clayton Christensen, *The Innovator’s DNA* (Boston: Harvard Business Review Press, 2011).

9. A company's innovation premium represents the premium that investors are willing to pay for a company's stock because they expect the company to launch innovations that will produce even bigger future income streams. It is the market value of the company minus the net present value of its existing businesses.

10. Jeff Dyer and Hal B. Gregersen, "The Secret to Unleashing Genius," *Forbes,* September 3, 2013.

Chapter 1

1. Scott Cook, personal interview, May 7, 2013.

2. The innovation premium, a metric for innovation performance that we developed and described in *The Innovator's DNA* (Jeffrey Dyer, Hal Gregersen, and Clayton Christensen, Boston: Harvard Business Review Press, 2011) represents the percentage of a firm's market value that cannot be accounted for by its existing business cash flows. We rank *Forbes* list of the world's most innovative companies using this methodology. See http://www.forbes.com/sites/innovatorsdna/2011/10/20/the-innovation-premium-our-methodology/.

3. Peter Drucker, *The Practice of Management* (New York: Harper & Row, 1954), 54.

4. For a detailed discussion of this case, see the Introduction.

5. Alternative explanations for an increase in the rate of patenting are globalization (international companies increasingly patenting in the United States), changes in patenting scope (increases in the number of patents of narrow scope), patent litigation (increasing patenting activities to create defensible intellectual property), and so on. Even in the face of these explanations, it's clear that the pace of technology invention (and adoption) has accelerated.

6. John Melloy, "iPad Adoption Rate Fastest Ever, Passing DVD Player," CNBC, October 4, 2010.

7. Robert R. Wiggins and Timothy W. Ruefli, "Schumpeter's Ghost: Is Hypercompetition Making the Best of Times Shorter?" *Strategic Management Journal* 26 (2005): 1249–1259; Rajshree Agarwal and Michael Gort, "Firm and Product Life Cycles and Firm Survival," *American Economic Review* 92 (2002): 184–190.

8. A score of 7 or 8 is deemed "passive" (see chapter 5).

9. Kaaren Hanson, personal interview, May 6, 2013.

10. Brad Smith, personal interview, May 6, 2013.

11. Hanson, 2013.

12. Ibid.

13. Roger Martin examines the role of innovation catalysts in a 2011 *Harvard Business Review* article, “The Innovation Catalyst.”

14. Cook, 2013.

15. Eric Ries, in *The Lean Startup: How Today’s Entrepreneurs Use Continuous Innovation to Create Radically Successful Businesses* (New York: Crown Business, 2011), uses “build-test-learn” terminology to refer to this experimentation loop. However, we prefer “hypothesis” to “build” because in many cases your experiment is testing a hypothesis without building anything.

16. Ben Blank, personal interview, May 6, 2013; Cook, 2013; and Thomas Eisenmann and Tanya Bijlani, “Intuit Inc.: Project Agranova,” Case 813062 (Boston: Harvard Business School, 2012).

17. Smith, 2013.

18. Lean start-up uses the term *minimum viable product,* but Intuit says it doesn’t want a minimum “viable” product; it wants a minimum feature set but one that delights customers. We discuss this more in chapter 5.

19. Hanson, 2013.

20. Cook, 2013.

21. Ibid.

22. Smith, 2013.

23. Ibid.

24. Ries, *The Lean Startup*.

Chapter 2

1. See http://www.quoteswise.com/elon-musk-quotes-2.html.

2. Frederick Winslow Taylor, *The Principles of Scientific Management* (New York: Norton, 1911).

3. Peter Drucker, *The Practice of Management* (New York: Harper & Row, 1954), 54.

4. Alfred Sloan, *My Years with General Motors* (New York: Crown Business, 1990).

5. Lawrence R. Gustin, *Billy Durant: Creator of General Motors* (Ann Arbor: University of Michigan Press, 2008).

6. Scott Cook, personal interview, May 7, 2013.

7. David Garvin, "How Google Sold Its Engineers on Management," *Harvard Business Review*, December 2013.

8. Ryan Tate, *The 20% Doctrine* (New York: HarperCollins, 2012), 26.

9. Nitin Verma, personal interview, August 26, 2013.

10. Cook, 2013.

11. Jeff Dyer, Hal B. Gregersen, and Clayton Christensen, "Innovative Companies Demand Innovative Leaders," HBR Blog Network, August 9, 2011, http://blogs.hbr.org/2011/08/innovative-companies-demand-in/.

12. Ibid.

13. Cook, 2013.

14. Paul Kirschbaum, personal interview, October 17, 2013.

15. Valve Software, “Valve Handbook for New Employees,” 2012.

16. J. J. McCorvey, “AmazonFresh Is Jeff Bezos’ Last Mile Quest for Total Retail Domination,” 2013, http://www.fastcompany.com/3014817/amazon-jeff-bezos.

17. Ricardo dos Santos, personal interview, October 30, 2013.

18. Ricardo dos Santos, “Just Say ‘Maybe,’” *Necrophone*, 2013, http://necrophone.com/2013/10/30/just-say-maybe/.

19. John Donovan, personal interview, December 20, 2013.

20. Ben Blank, personal interview, May 6, 2013.

21. Roger Martin, *The Design of Business* (Boston: Harvard Business Review Press, 2009).

22. Kaaren Hanson, personal interview, December 26, 2013.

23. “Valve Handbook,” 2012.

24. Bala Iyer and Thomas H. Davenport, “Reverse Engineering Google’s Innovation Machine,” *Harvard Business Review,* April 2008.

25. Brian M. Carney and Isaac Getz, “Google’s 20% Mistake,” *Wall Street Journal*, August 27, 2013.

26. Ryan Smith, personal interview, May 10, 2013.

27. Hanson, 2013.

28. Kirschbaum, 2013.

29. “Valve Handbook,” 2012.

30. Intuit Legal Department, 2013.

31. For an excellent summary of the dangers of using financial tools, see “Innovation Killers: How Financial Tools Destroy Your Capacity to Do New Things,” *Harvard Business Review*, January 2008.

32. Cook, 2013.

Chapter 3

1. Stephen Remedios, “Project Bushfire: Focusing the Might of an Entire Organization on the Consumer & Customer,” Management Innovation eXchange, January 1, 2013, http://www.managementexchange.com/story/project-bushfire-focussing-might-entire-organization-consumer.

2. Ibid.

3. Kala Vijayraghavan and Sagar Malviya, “Hindustan Unilever Ceo Nitin Paranjpe Targets to Work Towards Perfection in a Store,” *Economic Times,* August 10, 2011.

4. Michael Dell, personal interview, June 25, 2004.

5. Scott Cook, personal interview, May 7, 2013.

6. Clayton M. Christensen, *The Innovator’s Dilemma: When New Technologies Cause Great Firms to Fail* (Boston: Harvard Business Review Press, 2013).

7. Remedios, 2013.

8. Ibid.

9. Julia Kirby and Thomas A. Stewart, “The Institutional Yes: An Interview with Jeff Bezos,” *Harvard Business Review*, October 2007.

10. Kirby and Stewart, 2007.

11. Larry Huston and Nabil Sakkab, “Connect and Develop,” *Harvard Business Review*, March 2006.

12. Jeff Howe, *Crowdsourcing: How the Power of the Crowd Is Driving the Future of Business* (New York: Random House, 2008).

13. Howard Leventhal, Robert Singer, and Susan Jones, “Effects of Fear and Specificity of Recommendation upon Attitudes and Behavior,” *Journal of Personality and Social Psychology* 2, no. 1 (1965): 20.

14. Jeff Zias, personal interview, May 6, 2013.

15. Valve Software, “Valve Handbook for New Employees,” 2012.

16. Paul Kirschbaum, personal interview, October 17, 2013.

17. Teresa Amabile, “Motivating Creativity in Organizations,” *California Management Review* 40, no. 1 (1997): 39–58.

18. “Valve Handbook,” 2012.

19. Ryan Tate, *The 20% Doctrine* (New York: HarperCollins, 2012), 26.

20. Ibid, 28.

21. Matthew Herpen, “The Miracle Workers,” *Forbes*, September 2, 2013, 94.

Chapter 4

1. Mike Maples, personal interview, May 13, 2009.

2. As recounted by Maples, 2009, and in Jeffrey Rayport, Marco Iansiti, and Myra Hart, "Motive Communications," Case 699-157 (Boston: Harvard Business School, 2001).

3. Quoted in Clayton Christensen, Scott Cook, and Taddy Hall, "Marketing Malpractice: The Cause and the Cure," *Harvard Business Review*, December 2005.

4. Anthony Ulwick, "Turning Customer Input into Innovation," *Harvard Business Review*, January 2002.

5. Gianfranco Zaccai, "Why Focus Groups Kill Innovation, from the Designer Behind Swiffer,' 2012, http://www.fastcodesign.com/1671033/why-focus-groups-kill-innovation-from-the-designer-behind-swiffer.

6. See Jeffrey Dyer, Hal Gregersen, and Clayton Christensen, *The Innovator's DNA* (Boston: Harvard Business Review Press, 2011).

7. Juan Carlos, "DaviPlata: 'Self-Service' Financial Inclusion," Management Innovation eXchange, 2013, http://www.managementexchange.com/story/daviplata-financial-inclusion-all-using-self-service-transactional-product-going-kyc-kyc-know-.

8. Ibid.

9. Mark Sandhill, personal interview, January 5, 2009.

10. Alistair Barr, "Amazon Lending: Company Offering Loans to Its Online Sellers," *Reuters*, September 28, 2012; Sarah Needleman, "What to Know Before Borrowing from Amazon," *Wall Street Journal*, October 4, 2012.

11. Ibid.

12. Ibid.

Chapter 5

1. Isak Bukhman, *TRIZ Technology for Innovation* (Taiwan: Cubic Creativity Company, 2012); Genrich Altshuller, *And Suddenly the Innovator Appeared: TRIZ, the Theory of Inventive Problem Solving* (Worcester, MA: Technical Innovation Center, Inc., 1996).

2. Juan Carlos, "DaviPlata: 'Self-Service' Financial Inclusion," Management Innovation eXchange, 2013, http://www.managementexchange.com/story/daviplata-financial-inclusion-all-using-self-service-transactional-product-going-kyc-kyc-know-.

3. Andrew Hargadon, *How Breakthroughs Happen: The Surprising Truth about How Companies Innovate* (Boston: Harvard Business School Press, 2003).

4. Wendy Castleman, personal interview, January 13, 2014.

5. Brad Stone, "Inside Google's Secret Lab," *Bloomberg Businessweek*, May 22, 2013, http://www.businessweek.com/articles/2013-05-22/inside-googles-secret-lab.

6. Austin Carr, "Google's Project Glass: Inside the Problem Solving and Prototyping," *Fast Company*, June 5, 2012, http://www.fastcodesign.com/1669937/googles-project-glass-inside-the-problem-solving-and-prototyping.

7. Jessica Livingston, *Founders at Work* (New York: Apress, 2008).

8. Doug Berger, "Interview on Extreme Innovation: With Alberto Savoia (Google) and Jeremy Clark (Fxx)," The Innovators, 2011, http://www.innovate1st.com/newsletter/january2011/eXtreme_Innovation.pdf.

9. Jeanne Liedtka and Tim Ogilvie, *Designing for Growth* (New York: Columbia University Press, 2011).

10. Mark Goldenson, “Ten Lessons from a Failed Startup,” VentureBeat, 2009, http://venturebeat.com/2009/04/29/10-lessons-from-a-failed-startup/.

11. Marc Pincus and Bing Gordon, “A Serious Take on Internet Game Play,” video, Stanford Technology Ventures Program, October 28, 2009.

12. The term *minimum viable product* was first used by Frank Robinson and later popularized by Eric Ries.

13. Nathan Furr and Paul Ahlstrom, *Nail It then Scale It* (Lehi, UT: NISI Publishing, 2011).

14. Jared Allgood, personal interview, December 10, 2009.

15. Geoffrey A. Moore, *Crossing the Chasm* (New York: Harper Paperbacks, 2002).

16. Anonymous, personal interview, February 20, 2012.

17. Scott Cook, personal interview, May 7, 2013.

18. Amir Eftekhari, personal interview, January 7, 2014.

19. Gary Rhoads, Michael Swenson, and David Whitlark, *Boomstart* (Dubuque, IA: Kendall-Hunt, 2009).

20. Ryan Tate, *The 20% Doctrine* (New York: HarperCollins) pg. 22.

21. Ben Blank, personal interview, May 6, 2013.

22. Massolution, *The Crowdfunding Industry Report* (Massolution, 2013).

Chapter 6

1. “ChotuKool: An Innosight Impact Story,” video, Innosight, 2013. An abbreviated version is available online at: http://www.innosight.com/impact-stories/chotokool-case-study.cfm.

2. Ibid.

3. Ibid.

4. Ibid.

5. Additional sources for this story include G. Sunderraman, personal interview, February 14, 2013; and Eric Bellman, “Indian Firms Shift Focus to Poor,” *Wall Street Journal,* October 21, 2009.

6. Alexander Osterwalder and Yves Pigneur, *Business Model Generation: A Handbook for Visionaries, Game Changers, and Challengers* (New York: Wiley, 2010).

7. Jeffrey Dyer, Hal Gregersen, and Clayton Christensen*, The Innovator’s DNA* (Boston: Harvard Business Review Press, 2011).

8. *Upsells* refers to companies like Zynga or Skype offering a free product and then trying to get customers to purchase a premium version. Among free business models this is often referred to as “freemium.”

9. Suzanne E. Taylor, *Inside Intuit: How the Makers of Quicken Beat Microsoft and Revolutionized an Entire Industry* (Boston: Harvard Business Press, 2003).

10. Ibid.

11. Ian C. MacMillan and Rita McGrath, “Discovering New Points of Differentiation,” *Harvard Business Review*, July 1997.

12. Ibid.

Chapter 7

1. Jessica Livingston, *Founders at Work* (New York: Apress, 2008).

2. Peter Thiel, personal interview, March 16, 2004.

3. Livingston, 2008.

4. Ibid.

5. Phanish Puranam, Benjamin C. Powell, and Harbir Singh, "Due Diligence Failure as a Signal Detection Problem," *Strategic Organization* 4, no. 4 (2006): 319–348.

6. For more detail on different kinds of pivots, see Eric Ries, *The Lean Startup: How Today's Entrepreneurs Use Continuous Innovation to Create Radically Successful Businesses* (New York: Crown Business, 2011).

7. The research project consisted of two parts: first, a formally structured, multicase inductive study following ten innovators for a year, observing how innovators managed the change process, and second, a convenience sample of established corporations pivoting during innovation.

8. For more detail about Aardvark's evolution, see Thomas Eisenmann et al., "Aardvark," Case 811064 (Boston: Harvard Business School, 2001).

Chapter 8

1. For example, see Noam Wasserman, “Founder-CEO Succession and the Paradox of Entrepreneurial Success,” *Organization Science* 14, no. 2 (2003): 149–172; Warren Boeker and Rushi Karichalil, “Entrepreneurial Transitions: Factors Influencing Founder Departure,” *Academy of Management Journal* 45 (2002): 818–826.

2. Ryan Smith, personal interview, May 9, 2013.

3. Nathan Furr and Paul Ahlstrom, *Nail It then Scale It* (Salt Lake City, UT: NISI Institute, 2011).

4. Everett Rogers, *Diffusion of Innovations,* 5th ed. (New York: Free Press, 2003).

5. Geoffrey Moore, *Crossing the Chasm: Marketing and Selling Disruptive Products to Mainstream Customers,* revised ed. (New York: HarperBusiness, 2006).

6. Ibid.; and Geoffrey Moore, *Inside the Tornado: Strategies for Developing, Leveraging, and Surviving Hypergrowth Markets* (New York: HarperBusiness, 2004).

7. Filipe M. Santos and Kathleen Eisenhardt, “Constructing Markets and Shaping Boundaries: Entrepreneurial Power and Agency in Nascent Fields,” *Academy of Management Journal* 52, no. 4 (2009): 643–671.

8. Ryan Smith, personal interview, May 9, 2013.

9. Corey Wride, personal interview, October 13, 2013.

10. Meg Whitman, personal interview, November 5, 2004.

11. T. R. Weiss, “Q&A: Craig Newmark,” *Computer World*, February, 2007, http://www.computerworld.com/s/article/print/9053838/Q_A_Craig_Newmark_of_Craigslist_fame_looks_back_and_ahead.

12. Ibid.

13. Marc Benioff, “How to Create Alignment within Your Company in Order to Succeed,” Salesforce Blog, April 9, 2013, http://blogs.salesforce.com/company/2013/04/how-to-create-alignment-within-your-company.html;. also discussed in Marc Benioff, *Behind the Cloud: The Untold Story of How Salesforce.com Went from Idea to Billion-Dollar Company and Revolutionized an Industry* (New York: Jossey-Bass, 2009).

14. Ibid.

15. Ibid.

16. Jim Cavalieri, personal interview, September 24, 2013.

Chapter 9

1. Everett Rogers, *Diffusion of Innovations,* 5th ed. (New York: Free Press, 2003).

2. Kate O'Keeffe, John Marsland, Carlos Pignataro, and Lisa Voss, "Unleashing Inclusive Innovation at Cisco," Management Innovation eXchange, January 7, 2013, http://www.managementexchange.com/story/unleashing-inclusive-innovation.

3. Kate O'Keeffe, personal interview, October 24, 2013.

4. Kate O'Keeffe, personal interview, March 11, 2014.

5. Ibid.

6. Ibid.

7. See http://en.wikipedia.org/wiki/Google_Glass; Jared Newman, "Google's 'Project Glass' Teases Augmented Reality Glasses," *PC World*, April 4, 2012; Nick Bilton, "Behind the Google Goggles, Virtual Reality," *New York Times*, February 23, 2012.

8. Clayton M. Christensen, *The Innovator's Dilemma: When New Technologies Cause Great Firms to Fail* (Boston: Harvard Business Review Press, 2013).

9. Ibid.

10. Ibid.

11. Rogers, 2003.

12. History of the Swiss watch industry adapted from Amy Glasmeier, "Technological Discontinuities and Flexible Production

Networks: The Case of Switzerland and the World Watch Industry," *Research Policy* 20, no. 5 (1991): 469–485.

13. Ron Adner, *The Wide Lens: What Successful Innovators See That Others Miss* (New York: Penguin/Portfolio, 2012).

Conclusion

1. George Yancopoulos, personal interview, December 10, 2013.

2. Ibid.

3. Ibid.

4. Ibid.

5. Ibid.

6. William Bains, “Failure Rates in Drug Discovery and Development: Will We Ever Get Any Better?” *Drug Discovery World*, Fall 2004, http://www.ddw-online.com/business/p148365-failure-rates-in-drug-discovery-and-development:-will-we-ever-get-any-better-fall-04.html.

7. Matthew Herper, “How Two Guys from Queens Are Changing Drug Discovery,” *Forbes,* September 2, 2013, http://www.forbes.com/sites/matthewherper/2013/08/14/how-two-guys-from-queens-are-changing-drug-discovery/.

8. Yancopoulos, 2013.

9. Ibid.

10. Ibid.

11. Jeff Bezos, personal interview, July 30, 2007.

12. John Donovan, personal interview, December 20, 2013.

Acknowledgments

Nathan Furr

For almost a decade, I've had a deep suspicion that we might not really understand how to manage the uncertainty of innovation. While everything I learned at business school was highly relevant to the relative certainty of capturing value, I began to wonder if traditional management might not work so well given the relative uncertainty of creating value. My suspicion grew during my time at Stanford, as I watched the design school being formed at the same time as the Lean Startup movement gathered near-religious fervor among entrepreneurs who were also angry about the failure of the methods they had learned in business school. I found it stunning that in most academic entrepreneurship texts, there was plenty of information about the antecedents of entrepreneurship and its outcomes (e.g., IPOs, acquisitions), but the sections on the process —how to create value under uncertainty—were basically blank. I concluded that perhaps we hadn't truly understood the process of creating new value in the first place and wrote a book to explain it called *Nail It Then Scale It* to help new entrepreneurs avoid the mistake of scaling an unproven innovation too early: a mix of motivation and "how to" that came out simultaneously with my colleague Eric Ries's book, *The Lean Startup*.

However, as I reflected on the first book and researched the history of management, I concluded that, as a field, management faces a much deeper and graver challenge. If we look at the history of management (and most other fields, with the possible exception of the humanities), it was founded in response to a particular problem: how to manage and optimize the large firms created by the Industrial Revolution. In other words, management was designed to make trains run on time. The topics of innovation and entrepreneurship were scarcely studied at all until the last few decades, and even when they did finally appear in business schools, we carried over many of our existing management theories—designed for conditions of relative certainty—into the context of innovation. Only now are we awakening to the fact that because these theories were founded on the assumption of relative certainty and for a different purpose

(capturing value), they work poorly for uncertainty and creating value. It is an awakening that has occurred in other fields that have encountered uncertainty: design thinking in engineering, lean startup in entrepreneurship, agile software in computer science, and active learning in physics are the individual responses of each field to managing radical uncertainty.

Although I became convinced that we need a new set of theories and tactics to manage under conditions of radical uncertainty, I confess I lacked the courage to swim upstream against the prevailing current. When I began discussing my ideas with Jeff Dyer, he believed I might be onto something and gave me the courage to move forward on this book and on my broader research agenda. I don't mean to say that others have not made great strides in the right direction on innovation (I'm particularly appreciative of the academic work of Clay Christensen, Kathy Eisenhardt, Vijay Govindarajan, Ian MacMillan, Roger Martin, Rita McGrath, Tina Seelig, and Bob Sutton). However, it takes courage to suggest that the field might have gotten a foundational assumption wrong and, as a result, although all that we have discovered has immense value in many contexts, we need a different, or at least dramatically modified, set of theories for the context of radical uncertainty.

I would like to thank Jeff Dyer for helping me find the courage to share this message and for being such a supportive friend, robust thinker, and wonderful coauthor. He is one of the finest human beings I will ever meet. I would also like to thank my Stanford mentors, colleagues, and friends who started me on this journey, particularly Kathy Eisenhardt, my adviser, and Steve Barley, Tom Byers, Tina Seelig, and Bob Sutton. I would also like to thank Steve Blank for his interest and mentorship, Eric Ries, with whom I forged an early research partnership, Tom Eisenmann, who provided his rigorous thinking, and Alex Osterwalder, who has been a friend and thought partner. In addition, my friends at BYU have been particularly instrumental, especially Professor Nile Hatch, Tom Peterson, and Gary Cornia who, as dean of the Marriott School of Management, helped me create time to work on this book. Thanks also to Gary Crocker, who provided significant insight and support,

Paul Ahlstrom, who encouraged me to write the first book, and the team at the Center for Entrepreneurship and Technology, led by Scott Peterson and Steve Liddle, who provided enthusiasm and financial assistance. I would also like to thank my academic colleagues Chris Bingham, Ben Hallen, Rahul Kapoor, Rory McDonald, Jackson Nickerson, Rob Wuebker, and the faculty at INSEAD, who encouraged me and helped me refine the ideas presented in this book. Furthermore, I owe a particular debt of gratitude to my team of research assistants, led by Salvael Ortega and complemented by some particularly fine researchers: Aaron Boswell, Sean Brown, Spencer Calvert, Kenton Nicholls, James Oakes, Jane Thomas, Mason Wooley, and Pavel Yurevich. I also want to thank the many executives who gave their precious time for the research and who are mentioned in this book, as well as those who are not mentioned. Your participation was crucial to making this research happen, and you have made the world a better place for it.

Last but not least, I'd like to express the depth of my gratitude to my wife Susannah for her endless support and belief in me and in my work. I am also deeply grateful to my parents and my four children, who have suffered through the research and writing of this book. Any thanks I could express here would be insufficient by countless orders of magnitude.

Moving forward, I hope to further develop the management science of uncertainty—what I have come to call the "Innovation School" in contrast to the more familiar business school. Many of my colleagues have already made excellent progress in this direction, and I hope that by setting the boundaries of our basic assumptions we can work together to create a new and richer perspective on how to manage uncertainty and innovation.

Jeff Dyer

When Nathan Furr and I started discussing this project almost three years ago, I didn't fully grasp the potential of what we would learn as we did the research for this book. *The Innovator's Method* research has opened my eyes to the fact that we need a contingent view of management: managing under conditions of high uncertainty is really different than managing under conditions of low uncertainty. It also helped me see that "The Innovator's DNA" is typically just the starting point for innovation—and that we can all get better at testing and validating our ideas to make sure they will work before we invest in launching them into the market. I would first like to acknowledge and thank Nathan for being such a terrific coauthor. I've really enjoyed the collaborative process as we tried to make sense of what we'd learned from our research together. Moreover, Nathan gets things done. It's a delight to work with someone so capable.

The data collection effort for this book has been significant, and I have many research assistants to thank who worked countless hours on the manuscript. I would especially like to thank Mason Wooley, Chad Howland, Samuel Stapp, Kyle Nelson, Tyler Cornaby, and Zach Rogers. In addition, I'd like to thank Curtis Lefrandt, principal and VP of training and product development at Innovator's DNA, for his helpful comments on the manuscript and for his role in working with Ben Terres to develop the visual graphic of the Innovator's Method. Ben Terres deserves special mention for his excellent design work on the main graphic, and Mason Wooley similarly deserves special mention for his capable assistance on the majority of the graphics that appear in the book. I would also like to extend my thanks to Michael McConnell, an adviser of HOLT (a division of Credit Suisse), who conducted the Innovation Premium analysis for the companies we analyze in the book. The transcriptions of all of the interviews carried out by me and/or Nathan were done by Nina Whitehead and her staff, who always seemed to meet my ASAP deadlines. Indeed, all of the staff members that support me at Brigham Young University are terrific and deserve my thanks, especially my assistants Holly Jenkins, Stephanie Graham, Stephen

Powell Gustin, Marissa Tenney, and Preston Alder. I also must extend my heartfelt thanks to former BYU dean Gary Cornia and Entrepreneurship Center directors Steve Liddle and Scott Peterson, who have provided research funding over the last three years to support this project.

I would also like to thank a number of folks who provided extremely useful insights during the research phase of the book. Many of them come from Intuit; most notably Scott Cook, Brad Smith, and Kaaren Hanson, but also Josh Walker, Amir Eftekhari, Ben Blank, Alan Tifford, Jeff Zias, Wendy Castleman, Joe Hernandez, and Rachel Evans. I'd also like to thank Jodi Maroney (PR Access), who helped facilitate our visits and interviews with Intuit executives. Thanks also to Marc Benioff and Jim Cavalieri of Salesforce.com, John Donovan and Rob Lister of AT&T, Jeff Bezos of Amazon.com, and Paul Kirschbaum of Valve Software for the valuable insights they provided during numerous interviews. Finally, I would like to thank my friend Clayton Christensen for writing the foreword to the book and also our endorsers, Marc Benioff, John Donovan, Brad Smith, Bob Sutton, and Steve Blank for kindly reviewing the manuscript and sharing their thoughts about it.

I wish I could write a book without it taking over my life for a least a short period of time. As always, I owe a deep debt of gratitude to my wife Ronalee, who has always supported me in my work and patiently listens to me drone on about this and that related to whatever project I am working on. Ronalee especially deserves recognition for taking such great care of our family and catching the balls I invariably drop when I am focused on completing a book.

About the Authors

Nathan Furr earned his PhD from the Stanford Technology Ventures Program at Stanford University and is currently a professor of innovation and entrepreneurship at Brigham Young University (ranked among the top five in entrepreneurship education) and a visiting scholar at INSEAD and ESSEC. Furr is a recognized expert on innovation, entrepreneurship, and change, coauthoring *The Innovator's Method* and *Nail It Then Scale It: The Entrepreneur's Guide to Creating and Managing Breakthrough Innovation*.

Furr's research focuses on innovation and technology strategy, particularly on how new and established firms manage the uncertainty of technological change and innovation. His research has been published in leading journals such as *Strategic Management Journal, Organization Science,* and *Strategic Entrepreneurship Journal,* as well as being featured in *Forbes, Sloan Management Review,* and similar outlets. His research has received multiple national and international awards from the Academy of Management, the Kauffman Foundation, the Sloan Foundation, and other highly recognized academic institutions. Based on this research, Professor Furr has created or taught interdisciplinary innovation programs at BYU, Stanford, ESSEC, and other schools. He also cofounded the International Business Model, a competition that reinforces the methodologies he teaches and that attracted over 2,500 teams from more than 250 universities around the world in its most recent year.

Professionally, Professor Furr has acted as the founder or adviser to corporations and start-ups in the health care, clean technology, professional services, internet, retail, and financial services industries. He also sits on the investment board of the Kickstart Seed Fund, an innovative early-stage venture fund. Furr was a

management consultant at Monitor Group, a premier international strategy consulting firm, working with senior executives on a range of strategic and market discovery initiatives. Clients have included AT&T, Sony, Tec de Monterrey, USTAR, and other leading companies and organizations.

Jeff Dyer (PhD, UCLA) is the Horace Beesley Professor of Strategy at Brigham Young University as well as a professor of strategy at the Wharton School. Before becoming a professor, Dyer spent five years as a consultant and manager at Bain & Company. His book, *The Innovator's DNA,* coauthored with Clayton Christensen and Hal Gregersen, is a business bestseller, has been published in more than thirteen languages, and won the 2011 Innovation Book of the Year Award from Chartered Management Institute. The December 2009 article of the same name was runner-up for the prestigious McKinsey Award for best *Harvard Business Review* article of the year.

Professor Dyer is the only strategy scholar in the world to have published at least five times in both *Harvard Business Review* and *Strategic Management Journal,* the top academic journal in strategy. In 2012 he was ranked the world's #1 "most influential" management scholar among scholars who completed their PhDs after 1990 by the peer-reviewed journal, *Academy of Management Perspectives*. This ranking was based on more than thirteen thousand academic citations and almost five hundred thousand Google searches on his name. Dyer's book, *Collaborative Advantage,* won the Shingo Prize Research Award, and his *Team Building* book (with Gibb Dyer and William Dyer) is in its fifth edition.

Professor Dyer's research has been covered by *Forbes,* the *Economist, Fortune, Businessweek,* the *Wall Street Journal,* CNN, and many other publications. He delivers speeches and workshops on innovation to clients such as Adobe, AT&T, Cisco, General Electric, General Mills, Gilead Sciences, Harley-Davidson, Hewlett-Packard, Intel, Life Technologies, Medtronic, and Sony.