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- Brad Smith, Intuit President & CEO

# THE LEAN ENTERPRISE

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How Corporations Can  
Innovate Like Startups

Trevor Owens · Obie Fernandez

WILEY

# The Lean Enterprise

## How Corporations Can Innovate Like Startups

Trevor Owens and Obie Fernandez

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# Chapter Six: The Lean Enterprise Process

Until recently, developing new products was a haphazard affair based on a combination of past performance and gut instinct. Companies had little choice but to play the product/-market lottery. The standard path for anyone seeking to bring something new to market, whether in a startup or a large company, was – and still is, in much of the economy – a long, hard slog to the public launch. You specify the offering, assemble a team, and then go into stealth mode to design, build, and manufacture it. You take the utmost care to perfect every feature; after all, if it were flawed, people might not recognize just how brilliant and useful it really was. Then, when it's polished and ready, you call a climactic press conference and release your baby to an unsuspecting public. The world is overwhelmed by your visionary genius and flawless execution. Reviewers sing your praises and customers would flock to distribution outlets to buy your creation. Profit!

Or not. Much of the time, the product sinks without a trace, and all the time, energy, and money is wasted. You may as well have gambled your capital on a roulette table in Vegas.

Eric Ries developed the Lean Startup –â,,ç method to avoid such dire consequences. Ries drew on ideas from Blank's process of customer development, Rolf Faste's and David Kelley's notion of design thinking, agile software development, and the Toyota Production System to create a method for developing successful businesses amid these uncertainties. The lean startup method offers a repeatable way to determine

who your customers are, what they want, how to deliver it, and how to make money along the way.

The core of lean startup is experimentation, the application of scientific method to business. By following a rigorous procedure for isolating uncertainty and mitigating it, you can learn what you need to know to launch products and services that resonate with customers because they've been carefully designed to do so and tested to make sure they work.

## Roots of the Lean Startup

Before delving into the lean startup process, let's take a look at how it evolved from earlier approaches to product development. The software industry serves as a useful microcosm. In the 1970s, developers drew on techniques derived from manufacturing and construction to define the waterfall method. This method dictates a sequential process leading from specification to design to implementation to maintenance, each step of which must be completed before continuing to the next. Its methodical pace fits well with the corporate need for quarterly reports and strategic plans, and it presupposes a stable operating history that makes it possible to forecast future performance based on past accomplishments. You know who your customers are, what problems they have, and what solutions they want.

By the mid-1990s, the waterfall method's drawbacks had become apparent. It was a slow barge in the fast-moving stream of technological development. Moreover, entrepreneurs paid a high price for lack of foresight early in the process, as revisions to the initial specification based on new information or changing conditions required going back to square one and repeating each step.

The agile software development method emerged as an alternative. In this approach, designs, rather than being specified up-front, evolve through a series of short, iterative cycles that allowed rapid and flexible responses to changing conditions. Agile liberated programming teams from the slow pace of corporate bureaucracy. It's well suited to creating products in a networked world where information travels in the blink of an eye. However, like the waterfall approach, it presupposes that you know your customers and their problems.

The years since roughly 2000 have brought one disruption after another: Social networking, cloud computing, mobile computing, wearable computing. The pace of change has outstripped the speed of top-down management. At the same time, it has become clear that startups require a special kind of management distinct from that of established companies. In his classic book, *Four Steps to the Epiphany*, serial entrepreneur and business school professor Steve Blank observed that a startup is not a smaller version of a corporation. Where established companies know their market, startups don't know who their customers are, what they want, or how to get them to pay for it. They need a different way to bring new products to market. The lean startup method is designed to meet their needs.

## Limitations

As powerful as lean startup methods are, they're not without limitations. They're tailored for developing ideas from concept to product/market fit under conditions of extreme uncertainty. They're less effective to the extent that prevailing conditions are well understood. Thus, the lean startup process may not be appropriate to the following situations.

**Legacy projects.** Projects that are *already in motion* are

poor candidates for development according to lean startup principles. Decisions made without validation become an anchor that keeps the project from reaching product/market fit. The innovation colony should take on only new projects.

**Products that have reached product/market fit.** Intensive experimentation is most effective in the early stages of product development. Once a product or service reaches product/market fit, it has a base of customers, and information sources such as customer support become the driving force behind further development.

**Products that must match a pre-existing specification.** A product designed around a specific customer's needs may leave little or no room for experimentation. If the specification is already known, there's nothing to discover, and waterfall-style development is the best approach.

**Products aimed at regulated industries.** Lean startup methods are largely unsuitable in highly regulated industries such as medicine and finance. Tightly prescribed standards and practices will stifle an innovation colony's innovative capacity. The only way around this barrier is to produce (or latch onto) radical innovations such as bitcoin, which skirts financial regulations due to its status as a currency independent of national governments.

## Sprints

Agile software development was a major influence on the thinking behind the lean startup method. Programmers following agile principles move their projects forward through a series of short production cycles known as *sprints*. A sprint consists of planning activities followed by execution. Afterward, the team revisits the plan and undertakes the next round of execution. A sprint typically lasts a week – long

enough to get substantial work done, but not so long that team members lose their focus. This practice yields steady progress and predictable results.

Innovation teams working in a lean enterprise environment use the same framework. Like agile software development, the experimental process cycles through brief periods of learning, building, and measurement. At the end of a sprint, team members evaluate the data they've collected, adjust the product or service they're testing, and launch a new round of experiments. These cycles can be longer or shorter than a week, but that's a good place to start.

## **Quick Overview of the Experimental Process**

Experimentation is the heart of the lean startup method. Four things are necessary to do it effectively: a hypothesis, the riskiest assumption that underlies the hypothesis, a test method, and success criteria.

In science, an experiment tests a hypothesis to find out whether it's true or false. In the lean enterprise, the hypothesis generally states a customer problem. For the bike repair manual company, the hypothesis might be: Bicyclists have a problem getting information about how to repair their bikes while they're out riding.

Implicit in this hypothesis are several assumptions, including: Bikes break down on the road. Bikers don't know how to fix their bikes. Bikers would fix their bikes if they had the right information. Bikers carry mobile devices while they're riding. Some of these assumptions carry little uncertainty. For instance, you can be fairly sure that bicycles sometimes break down while in use.

However, other assumptions are less certain. One of them might be characterized as the *riskiest assumption* in the list: Do most bicyclists already have the information they need to repair their bikes in the event of a breakdown? If it turns out that bikers lack repair information, then you've gone a long way toward validating the hypothesis. (Some uncertainty remains, but you can mitigate it by zeroing in on the next most risky assumption.) If, on the other hand, you find that bikers have all the information they need, then you've invalidated the hypothesis as a whole. That is, you've learned definitively that, no, bikers don't have a problem getting information about how to repair their bikes when they're out riding.

To prove the riskiest assumption true or false, you need to devise an experiment. It might be a series of interviews with bicyclists. It might be collecting data on breakdowns at an observation station along a bike path. It might be an offer to pre-order the mobile repair manual. Each alternative is a different way to test the riskiest assumption. It's important to choose a method that can be executed as quickly, easily, and precisely as possible. When you've completed the experiment, you analyze the results and decide whether to pivot – that is, move on to a new hypothesis – or persevere and continue to develop the idea.

Before launching the experiment, you need a clear idea of the minimum result that would validate the assumption you're testing. Would finding three out of five bicyclists who want mobile repair information be sufficient? Or would we require a larger percentage and/or a later sample? The answer is subjective, but it's a very idea to enter the experiment without success criteria firmly in hand. Setting success criteria helps you avoid the common traps of confirmation bias and risk aversion.

## Confirmation Bias

Confirmation bias is the tendency to pay more attention to evidence that confirms your assumptions than evidence that conflicts with them. People often ignore information that challenges their preconceptions.

This phenomenon is deeply rooted in psychology and has been noted by writers as far back as ancient Greece. People love their ideas, and none more than talented entrepreneurs. Salespeople are masters of confirmation bias; their work often depends on finding encouragement in signals that others would deem negative. So are entrepreneurs, the best of whom famously generate a reality distortion field that affects everything they touch. But that superpower can lead them astray when reality fails to bend to their will.

In Lean Startup Machine workshops, when we ask people how their experiments are going, it's always unsettling to hear them reply, "Everyone loves the product!" We ask whether their prospective customers signed a letter of intent, and they answer, "Oh, they would have if we had asked." Team leaders, who usually come up with the idea their team is working on, often fall into this trap. The leader says, "This is awesome," but the rest of the team looks drained and pessimistic.

A team may be struggling with negative results all day, and then a prospective customer magically tells them everything they were thinking all along. If they haven't defined success criteria ahead of time, they may well see this positive input as a vindication of their effort. But if they have, they'll recognize that one customer's enthusiasm is not sufficient to validate their assumptions.

## Risk Aversion

When confirmation bias is strong enough, it can lead people to avoid any situation that would call their beliefs into question. This state is called risk aversion, and it's deadly to performing valid experiments. In practice, it shows up as unwillingness to confront the riskiest assumption or insistence on setting up an experiment in such a way that it's bound to succeed.

At a recent workshop, one team was trying to validate a mobile app designed to mitigate long lines at coffee shops by letting customers pre-order. The hypothesis was that coffee shops with long lines lost business when customers entered, saw the line, and decided to go elsewhere, and that they could use an app that made the line shorter.

The team interviewed several customers and received a lot of validation. However, the primary target of their app wasn't coffee drinkers but coffee shop managers, and they didn't interview any of those. Analytically speaking, they were approaching a two-sided market and making assumptions about both sides, but they chose to test assumptions about the less risky side first. There are a few reasons why a coffee shop manager might not want shorter lines: For instance, they might believe that long lines might attract customers rather than repelling them, and that customers would value the product more if they had to wait for it. This team avoided the riskiest assumption but never recognized the error.

In a real-world product development situation, that mistake would have led to a substantial amount of wasted resources. The solution is simple: Test your assumptions in order of risk and set clear success criteria so you know when you've validated them.

## Documentation

It's helpful to document your progress in testing ideas from conception to completion. At Lean Startup Machine, we've adopted three simple forms that keep team members on the same page and simplify backtracking and problem solving if anything goes awry.

### Idea Brief

An idea brief sets the stage for determining whether a given idea is worth pursuing. It's a page that documents your product idea, the circumstances that inspired it, your hypothesis, and a list of underlying assumptions. It serves as a point of departure for initial discussions intended to sharpen the idea, hypothesis, and assumptions. Once experimentation is underway, it serves as a reference to keep the team on track until you decide to pivot and open a new idea brief.

### Experiment Log

Most experiments have limitations and flaws, and a detailed record can make it easier to address shortcomings after the fact. The experiment log is a spreadsheet with spaces for noting riskiest assumption and experimental method as well as dates, times, participants, and results. If you're tracking interviews, for instance, you may devote a row to each question and put the various answers in separate columns, plus a final column for analysis and conclusions.

### Learnings Report

At the end of an experiment, take time to analyze and record the most important lessons learned: key insights, discoveries, surprises, and the like. This is the place to

note customer problems you haven't previously identified – observations that can lead to the next hypothesis. It's important to collect them after the experiment has concluded. If you collect them ahead of time, you'll be recording hunches rather than validated learning.

## Experimental Process: Step By Step

With this summary of the experimental process in mind, let's take a closer look at each step.

### Form a Hypothesis

The hypothesis states your idea for a product or service by formulating it in a way that can be tested. One problem innovators face is that their ideas are usually amorphous and multifaceted. This makes them hard to test. One aspect of the idea might be true while other parts are false. So it's necessary to constrain the idea and state it in a clear, simple, testable form.

In the lean startup, we talk about two different kinds of hypotheses, the *problem hypothesis* and the *solution hypothesis*. A problem hypothesis asserts that a problem exists, a problem that your product is intended to solve. For instance, "A particular type of customer has a particular type of problem." Logically, if you talk to any customer who fits the description you've specified, I should find that he or she has the problem you've described. A solution hypothesis proposes that a given capability (i.e., one supplied by your product) will have a specific impact: "This particular capability will produce that particular outcome." That is, if someone uses

a product that has the attributes you describe, it will bring about a change in behavior and thus a business outcome. Such statements can be tested because they posit a cause and effect relationship between two variables.

The first of these two formulas is best because it limits your inquiry to options that have a basis in the real world rather than imagination. It does this by focusing on customer needs. Every customer has a problem, and every problem has a solution. There's a finite number of customers, and consequently they have a finite number of problems that have a finite number of solutions. On the other hand, every solution does not have a problem, and every problem does not have a customer – which is to say that an infinite number of possible solutions exist, many of them irrelevant to the market at large. By focusing on customers and their problems, you'll keep your ideas moored to reality.

## **Identify Your Riskiest Assumption**

Every hypothesis rests on a bundle of beliefs. There's no sure way to identify them all, so the best approach is simply to brainstorm as freely as possible. If the hypothesis is true, what else must be true? Give yourself ample time and mental space to record every assumption that comes to mind, and have teammates do the same. Ask for help from coaches, mentors, and people who are familiar with the market you're investigating. No problem if the list is repetitious or if assumptions overlap. The point is to isolate as many as you can, as early as you can.

Once you've generated a list, pare it down essentials. Eliminate those that overlap. Remember, your hypothesis depends on these statements. If one is false, the hypothesis is, too.

Now you're ready to figure out which assumption is the most uncertain. You'll need a large piece of paper and a pad of sticky notes. Draw an x/y grid on the paper. One axis represents the degree of certainty of a given assumption, from low to high. The less information you have about it, the higher it rates. The other represents how critical an assumption is to the validity of the hypothesis, from low to high. The more heavily the hypothesis rests on it, the higher it rates. Write your assumptions on sticky notes, one per note, and stick the notes on the grid where you think they belong.

The one you've placed closest to the upper right-hand corner is your riskiest assumption. When it's time to conduct experiments, you'll test this one first and then remove it from the grid. Each time you run a new experiment, you'll test the assumption that's closest to the upper right-hand corner. This process will continue until you've either tested all your assumptions, invalidated your hypothesis, or received sufficient validation to launch a product.

## Choose a Test Method

There are four ways to test an assumption. It's helpful to think of them as phases to be executed in order and take them one at a time during your first several projects. As you gain experience, you can choose the one that's most appropriate to your riskiest assumption at any given point. We'll go into each one in depth in the chapter entitled **EXPERIMENTMETHODSTK** on page TK.

### Research

The first phase is research consisting of interviews, observation, and/or re-enactment. In this method, you

collect information by interviewing prospective customers or observing their behavior.

### **Pitch**

In this phase, you're asking prospective customers to demonstrate their interest by giving you contact information, a letter of intent, money, or some other token of commitment.

### **Concierge**

The third phase consists of manually delivering the benefits of your offering to paying customers, face-to-face. This is a real-world simulation of the product or service you intend to bring to market.

### **Prototype**

Phase four is getting paying customers to use a functional mock-up. In this phase, you're delivering a minimum viable version of your product or service, more or less as you envision it.

There are many reasons why you might skip some of these techniques or use them in a different order. Research is more or less mandatory for a highly innovative project that has no obvious antecedents. On the other hand, you might skip that phase if you're starting with a high degree of domain knowledge. In that case, you can start with pitching as a way to gather customers for the concierge phase. You might go straight to prototype if you've already concierged in the course of coming up with the idea (say, users of a different product have asked for a further set of capabilities and you've been giving it to them on a limited basis) or you're innovating incrementally on an existing product category (that is, if a hardtop is on the market but no convertible).

The current riskiest assumption, too, can guide your choice. For instance, research is called for if you're uncertain whether people care at all about the problem you're solving. If you're certain that some people care but you're not sure how many, you might go straight to pitch. The riskiest premise might be whether you can deliver a satisfying experience, in which case concierge is the most appropriate technique. A prototype can lay to rest questions about whether the business model adds up.

The key is to choose the technique that leads most directly to learning about the riskiest assumption. The more information you have, the less risk your project poses.

## **Segment Customers**

Part of your experimental effort should be devoted to segmenting the market, or verifying assumptions about who your most receptive customers will be. In traditional marketing, customer segments tend to be defined by demographic characteristics such as age, gender, and occupation. A more effective approach is to pinpoint a cause-and-effect relationship between a person's characteristics and their interest in your offering. If you're selling pop-up basketball hoops, for instance, a demographic or physical description of target customers, such as "men under 30 years old who are over six feet tall," confuses correlation with causation. Instead, try to describe people who share a common activity, goal, or problem that would make them receptive to your offering, such as "people who live in urban areas and play basketball in their spare time."

This focus is especially important when it comes to innovative products. Your best prospects are early adopters who are on the leading edge of consumer behavior regardless of

their demographic characteristics. Early adopters are defined by five traits: they're aware that they have a particular problem, they don't view it as insurmountable, they've searched for a solution, they've either used existing solutions or tried to hack one for themselves, and they don't face constraints (such as geographical or financial limitations) that would keep them from using your solution. They make an excellent resource for testing innovative ideas because they'll understand better than other potential customers what your product should do and how it should work, and they'll be receptive to a rudimentary concierge or prototype as long as it solves their problems.

Ideal early adopters are what we call cookie monsters: They're hungry for a solution and their excitement is palpable when they find one. If you find any cookie monsters, be sure to collect their contact information and share your progress with them regularly. In terms of learning, one cookie monster is worth thousands of ordinary customers.



### Customer Persona

Here's a helpful tool for market segmentation. Commonly used in marketing, a *customer persona* is a fictional character who represents target users of a product or service. The document consists of a sketch with an imaginary name, idealized demographic information, and descriptions of goals and pain points. It helps the innovation team agree on who the target customers are and to get inside their heads. If you're discussing a product feature or a particular experiment, the persona can help keep the conversation focused on specific customer needs. Early in the product's life, it's best to keep personas to a minimum: You want to focus on cookie monsters. In some cases, though, you might need several; for instance, if your offering is designed for all ages, like Facebook. Don't forget to revise them as you learn more about who your best customers really are.

## Set Success Criteria

One more step prior to running any experiment: Decide on the learning that will constitute a *successful outcome*. It may include a minimum percentage of customers interviewed who confirm your riskiest assumption, number of visits to a landing page, or rise in a crucial metric. Think of an experiment's success criteria as the minimum amount of validation necessary to continue working on the project.

We became aware of the importance of setting success criteria during a Lean Startup Machine workshop when par-

ticipants were giving their final presentations. A team leader proudly described the results of his team's research: 40 percent of people surveyed confirmed that they had the hypothesized problem and wanted a solution. He handed the baton to a teammate, who said, "Unfortunately, 60 percent of people we talked to didn't have any problem." For the leader, 40 percent was enough to proceed. For his teammate, it was a disappointing result. When you set success criteria ahead of time, everyone can move forward in agreement that the project is worthwhile.

Choose modest goals when you're early in the experimental process – getting one customer in 20 to validate your riskiest assumption might be enough at this stage. The more progress you make, the more you'll be able to home in on ambitious goals. It also depends on the type of business you're testing. If you're pitching a low-margin business, you may need a high percentage of potential customers to sign up. On the other hand, if you approach 30 executives at Fortune 500 companies, you may have the seed of a viable business if only one acknowledges your target problem.

An important part of setting success criteria is limiting the time spent. This makes sense if you think about success criteria in terms of opportunity cost; the more time it takes to complete an experiment, the higher the cost. Moreover, if you run an experiment forever, sooner or later you'll get the result you imagine. Gauge the speed at which you and your team can reach the number of customers you deem necessary. Choose an interval that lets you get the job done without wasting time. Every hour counts. Remember, your competition isn't other enterprises but startups that are geared for rapid execution. That's why it's so important to work in cross-functional teams rather than silos. If you need to wait

for approval from the sales department before you can talk to customers, you may as well close up shop. UX designers in a traditional enterprise can take a week or two to conduct an interview. A lean enterprise can't afford to take that time.

Success criteria can be especially difficult to determine when you're trying something unusual for which benchmarks don't exist. In lieu of precedents, you can get by with predicting what you think will happen, based on your understanding of reality. Make a safe prediction. If you don't meet it, you will have learned that your view of reality is flawed. That will teach you about your customers, and this new understanding will lead to better decisions all around.

A little back-of-the-napkin math can help. If you plan to pitch on the street for an hour, assess the value of your time. Is it possible, given the product or service you're pitching, to nail down commitments to that amount of money? That gives you a rational basis for deciding on the minimum amount of validation you require.

You're bound to set inadequate success criteria at the beginning, so it's not worth losing sleep over. The more you do it, the better you'll get. And the more experiments you conduct, the more benchmarks you'll have to draw on.

## **Build a Metrics Model**

As we've seen, a metrics model is a spreadsheet simulation of your business. We'll show you how to build one in METRIC-SSECTIONTK on page TK.

This step doesn't come into play in the research or pitch phases, but it's worthwhile before embarking on a concierge and a must before prototyping. That's because a prototype needs to be designed up front to deliver the measurements necessary to evaluate the business. If you build the model first,

you'll waste a lot of time rebuilding it once you know what variables you need to track.

## **Build an MVP**

Although the initial concept for your product or service may sprawl across an extensive, complicated feature set, for the purposes of experimentation, it's important to define an essential set of capabilities that constitute a minimum viable product, or MVP.

An MVP is a tool for learning what you need to know at any given moment with the least possible expenditure of resources. It doesn't need to represent the entire product, just the part you're testing at any given moment. If you're interviewing potential customers, the MVP may be a verbal description or video demo that communicates the product's value. If you're observing customer behavior, it may be a user interface mockup or a simple landing page that gives visitors a clear idea of the product's benefits but doesn't necessarily provide access to the product itself. Even in the prototype phase, an MVP can be extremely minimal – no more than the essentials required to validate the assumption you're testing.

The prospect of presenting an MVP is a stumbling block for many companies, especially established companies that have brand equity to protect. It seems wrong to offer customers a deliberately under-featured product or service, or worse yet, to mislead them into thinking that you've built it when your MVP is nothing more than a mock-up. It helps to realize that some customers actually appreciate a well thought-out MVP – and they're exactly the kind an enterprise innovation effort needs to reach. Early adopters are more excited by first-draft products than highly refined ones. They like to try new things. They aren't put off by bugs and

they're glad for the opportunity to contribute to the design of something they want to use. So gear your MVPs toward this population. Beyond that, keep in mind the goal: maximum learning at minimal cost, so you put your valuable resources into building things that people want rather than wasting them building things that people don't want. Your job is to find the shortest path between assumptions and validated learning, and that can involve a great deal of creativity.

The MVP can be whatever you need it to be for the purpose of a given experiment. It must spark customers' imaginations and prompt them to take the actions required by the current experiment while requiring you to build as little as possible. The more quickly and cheaply you can manage that, the more efficiently you can give your customers what they really want.

## **Run the Experiment**

You've made a plan and now it's time to execute. This is the moment of truth. The results of your experiment will shed light on the current riskiest assumption, giving you invaluable real-world information. See **EXPERIMENTAL-METHODSTK** for an in-depth discussion of the practical aspects of various experimental techniques.

Note that every member of the innovation team is involved in conducting experiments. Everyone needs to get a feel for the product, its potential customers, and the business model that brings the two together. Progress at this stage is measured not in revenue, elegant design, or lines of code, but in how much you learn.

## Pivot or Persevere

After you've run the experiment, collect the data and analyze it. (In the prototype phase, and possibly in concierge as well, this will require plugging numbers into your metrics model.) Did the experiment meet its success criteria? If so, you're likely to persevere. If not, it may be time to pivot.

To persevere is to continue developing the idea. You've met or exceeded the minimum result needed to validate the riskiest assumption. From here, you may revise either the experiment or the offering with an eye toward eliciting stronger validation and then repeat the experiment. Or you can move on to testing the next most risky assumption.

To pivot is to go back to the whiteboard and come up with a new hypothesis. In the most literal sense, a pivot is a restatement of your business model. It's not an incremental change but a high-level shift in strategy. Tweaking or replacing a couple of features in a suite of many doesn't constitute a pivot, but scrapping all current features or reorienting the business around a single core feature does.

This isn't the failure it might seem to be. Rather, it's clear sign of learning and an important step along the path to product/market fit. Many highly successful products and services began in a very different form than the one in which they became famous. Starbucks began by retailing coffee makers and beans. Avon was a bookseller. Twitter began as a podcasting service. Flickr was an online roll-playing game, Instagram a mobile check-in service, YouTube a video dating site. So don't be afraid to pivot. It may be your ticket to ubiquity.

You can expect to pivot frequently when you're just starting out. Early learning tends to challenge preconceptions that may seem obvious but turn out not to match up to reality. The

more blind faith you have in an idea, the less motivated you are to seek out information that contradicts your assumptions. So if you're in the research phase and you don't pivot, it may be a sign of confirmation bias or risk aversion. Take a close look at your team and consult with mentors to avoid slipping into one of these common pitfalls.

Early on, the decision to pivot or persevere is largely a question of whether or not the latest experiment met its success criteria. As you get deeper into experimentation and build more validation, the decision becomes more complicated. You have a finite amount of runway, and the decision to iterate or start again from scratch is scary. Are you making enough progress toward the ideal? If not, how can you do it? Can it even be done? Team members can be at loggerheads: The engineer wants to improve the technology, the designer wants to improve the user experience, the business person wants to improve the bottom line.

Use the metrics model to break such logjams. The model boils down everyone's ideas into quantitative data you can use to shed light on the best way forward. It can help answer questions about how much closer you can get to the ideal, how long it will take, and how much it will cost. When the opportunity cost of persevering becomes too great, a pivot is in order.



and tracking experiments. Note that the brainstorming fields specify a time limit of five or 10 minutes. This constraint isn't a strict ceiling, but it's helpful to observe time limits to keep the process streamlined and to ensure that your team moves steadily toward validating or invalidating its ideas. The lower left-hand corner offers a handful of fill-in-the-blank phrases to help you get started. They cover forming problem and solution hypotheses, identifying assumptions, isolating the riskiest assumption, designing an experiment, and determining success criteria; refer to them when you reach an appropriate stage in the process.

First, take five minutes to have everyone on the team write a customer description on a sticky note and paste it on the board in the field labeled, "Who is your customer?" Choose one and stick it on the right-hand side of the board in column 1, adjacent to the label "Customer."

Now have everyone on the team describe a problem that customer has, from the customer's point of view, and write it on a note. Paste the problem description on the left-hand field labeled "What is the problem?" Choose one problem, again, stick it on the right-hand side of the board in column 1, adjacent to the label "Problem."

Skip the "solution" fields for now. Instead, have everyone on the team write down five assumptions that must hold true for the problem to be valid. Put those on the left-hand field labeled "List the assumptions that must be hold true for your hypothesis to be true." Discuss the degree of uncertainty surrounding each assumption and choose one as the riskiest. Paste it on the right-hand side, in column 1, adjacent to the field labeled "Riskiest Assumptions."

Then decide on an experimental phase: research, pitch, concierge, or prototype. The phases generally fall into this

order (which is based on how much information you have), so if the team is just starting out, in most cases, you'll start with research. Design an interview, observation, or re-enactment to test the problem hypothesis in column 1. Write the success criteria on a sticky note and paste it on the right-hand side of the board in column one, adjacent to the "Success Criteria" label.

Now it's time to "get out of the building" – Steve Blank's exhortation to talk to potential customers in the field. Work as efficiently as possible toward your success criteria within a predetermined time limit.

Having completed your first experiment, the team analyzes the results and uses them as the basis for a decision to pivot or persevere, as noted in the right-hand field labeled "Result and Decision" in column 1. Be sure to write down the key lessons learned and paste them just below in the field labeled "Learning."

At this point, the team clears the left-hand side of the board and repeats the process in column 2 to test a new customer and problem, this time adding a solution hypothesis.

The board includes only five columns, but that's an arbitrary limit. Continue through the loop as many times as it takes to discover a concept that resonates with customers and to develop it to product/market fit. Also, keep in mind that the Javelin Board is a simplified tool for keeping experimentation on track. The experimental method encompasses innumerable complexities and subtleties that will find their way into your practice as you gain experience with the process.

## Case Study: Nordstrom Innovation Lab

*JB Brown, director*

The Nordstrom Innovation Lab became a lean-startup sensation with a 2011 YouTube video that depicted the team using lean/agile techniques to create an iPad app that helped retail customers choose eyeglass frames. Lab personnel – working for a company that was founded in 1901, employs 50,000 people, and generated \$8.5 billion in revenue in 2013 – conceived, designed, and coded the app right in a Nordstrom store while customers watched, critiqued, and demoed their work. Under the direction of JB Brown, the lab fulfills strategic mandates and seeds entrepreneurial culture throughout the rest of the company. Brown, a University of Iowa software engineer who drove a pickup truck to the west coast to join the dot-com boom, explains below how he runs a classic corporate innovation lab.

### How did the Nordstrom Innovation Lab come about?

Brown: About three years ago, our board of directors looked deeply at the topic of innovation, and the Innovation Lab was born out of that discussion. They established the governance and funding model for a multi-year plan. I had been a developer and architect on our web site for four or five years, and during that time, I'd done subversive agile coaching to increase the rate of learning and remove waste in the waterfall process. I wanted to show how technology could be used in a more aggressive manner in retailing and to show the value of a lean development process. When I heard about the lab

opportunity, I hooked in and got the opportunity to start it.

## **Tell me about your funding, structure, and process.**

Funding is modeled after a venture capitalist approach. We have a fund set aside at the beginning the year. Anyone in the company can pitch for use of that money, but you have to have validated proof of your idea. You're not pitching a business case. You're pitching an emergent opportunity that you didn't plan at the beginning of the year. Our innovation committee, which includes our executive management team, says yes or no. They decide whether to invest seed capital to validate your idea enough to take it further. The key factor is whether a project has the potential to improve our customers' shopping experience.

## **How big is the lab?**

It's roughly 15 people, but it fluctuates in size. People are allowed to move out of the lab temporarily to freelance internally on a project that the lab either started or takes an interest in. We have designers, developers, ethnographers, and an industrial designer.

## **How would you describe your approach to innovation?**

I take my definition of innovation from Ideo and Stanford Design School. Innovation is discovery at the intersection of what's desirable, viable, and feasible. Desirable is whether customers want it, viable is whether it's good for business, and feasible is whether we can deliver it. In that way, innovation

is a virtual product, not a good, not a physical thing. The thing you build as a result of your discovery is innovative, but innovation is the discovery that made it possible.

## **Innovation labs and intrapreneurship programs face hurdles in overcoming legacy corporate structures, politics, and culture. How does Nordstrom manage those factors?**

It can be a struggle, but it's less of an issue for us because of the decisions we made at the beginning about our funding and structure. We have dedicated funding to find new opportunities that no one realized were possible or didn't exist before. The company has various channels – mobile, stores, web – but there's space in the market for us to find new opportunities.

## **How do you organize the experimental process?**

The lab is broken up into studios. Each studio has a body of work and people volunteer based on the challenges they're interested in. We start with a business challenge that has been given to us by the innovation committee, a problem or an area of growth to focus on. We get to know customers and their needs, including latent needs they may not be able to describe. We observe them, and based on what we learn, we form a hypothesis about how to solve their problems. Then we brainstorm solutions, pick a couple that we think are compelling, usually with the line-of-business sponsor. If it's a mobile solution, we might get the mobile VP involved to tell us how this relates to his strategy. Then we identify

areas of risk and mitigate them via MVP testing and careful innovation accounting. We view risk as volatility in the outcome, not the chance of a bad return. So we tackle the most volatile areas first by learning from each MVP attempt or experiment. We reduce volatility until we our outcomes are certain enough that our leadership team get behind them. It takes a number of iterations before we have a prototype of a solution.

## **What does volatility mean in this context?**

Volatility in the outcome. Customers will either love it or not. The technology either exists or doesn't. Our salespeople will either want to use it or not. If we feel like either outcome is equally likely, that's a big risk, and we want to remove it immediately.

## **How do you identify your riskiest assumption?**

At the beginning, we find that the greatest risk is almost always in desirability, so that's usually the place to start. The people on cross-functional squads are knowledgeable about technology, product development, and retailing, plus we have the ethnography we've done at the beginning. Put all that together and you can make an educated guess about where volatility is the highest. The team collectively comes to a point where they feel like they know which risks are biggest and which are the easiest to remove.

## **What role does innovation accounting play in your projects?**

We use it from the beginning. Usually, we'll pick what we think is the business model and identify the key measurements of success. At the beginning, it's a simple manual process. When we get to the point where we're trying to remove risks at a bigger scale, before going widely public, we'll use free open-source, cloud-based solutions that allow us to record metrics easily. If we get into something really complex, we'll lean on the data science lab, which is seated only a couple of feet away.

## **When would you call in the data science lab?**

As a multi-channel retailer, we face a challenge evaluating the impact of in-store experiences on sales. We may think we did well with a new product, where the business model is a marketing funnel and conversion happens in-store. Then we'll use the data science lab to correlate uplift in sales with our corporate data.

## **Do you worry that MVPs might hurt the Nordstrom brand?**

We pay attention to that. Usually our experiments start out internal and private. But at some point you have to be live, real, in public, to know whether you're getting a valid market response. Instead of going from completely private to completely public, we find ways to do semi-public experiments with small groups of customers. Sometimes we leverage our stores because we have local communities. Then we can test a

small group of people compared to a bigger market. That also helps with innovation accounting because you can move from community to community, and each experiment produces a fresh cohort.

## **How do you decide whether to pivot or persevere?**

This is where the art of entrepreneurship comes in. People who want to be successful have a natural tendency to persevere. It's part of our culture to make sure we're serving the customer in a way that leaves them delighted. So we've had a hard time, in the past, killing things that we thought could be successful with additional investment. I don't have a hard answer other than to gather plenty of outside perspective, watch innovation accounting, and make sure you're feeding qualitative information into your decision-making process. At some point, you have to decide where to put your money. You're never going to know the perfect answer before you do it.

## **The video of your 2011 one-week, in-store app development project is a classic demonstration of lean-startup techniques. Can you give us a broader sense of the scope of your projects?**

That video has a life of its own now. It was a great event in our lives and an important thing for our internal success, but we don't do one-week projects any more. We still focus on getting answers as fast as possible, but most of the time our objectives require us to go deeper. In late November 2013, we launched

an app that we started working on a year ago. It's a texting app that protects the privacy of salespeople and customers mutually. The law requires that texting for business use is opt-in, as opposed to email, which is opt-out, so it has been difficult to put it to use. Working with our privacy and legal departments, we've come up with an app that lets customers and salespeople text one another without being able to see one another's phone numbers. We've heard from customers and salespeople that they wanted to communicate by text, so we think this solves a real problem for them.

## **Do you develop physical products?**

We've done physical design of our in-store infrastructure. A couple of stores in California have a new beauty department design that we helped develop in response to customer feedback that our cosmetics area could be challenging to shop in. That involved physical prototyping and testing of a beauty concierge desk. Our first prototype was a table made of foam-core panels. We visited sororities here on the University of Washington campus and observed customers in a retail experience that was different from what we previously offered. We made sure that we understood the interaction between the salesperson and the customer before we spent a lot of time designing the actual prototype.

## **We feel strongly that innovation team members should have a portion of ownership in their projects. How do you handle compensation?**

The lab is part of the information technology department, and it's compensated and graded for performance the same way all other technology teams are. There's an element of truth in what you're saying, but I find fulfillment of purpose to be more important. If colleagues feel like their purpose is fulfilled, like they have the drive and autonomy to achieve it, I find that they're happy about their work. Ownership can be helpful with recruiting, but when we find people who appreciate the opportunity and the challenge, they usually accept offers that support their lifestyle, no equity needed.

## **What are your proudest accomplishments so far?**

My proudest accomplishment right now is that our mindset, our way of being, has extended beyond the lab. A small team has a built-in constraint. You're always going to have more ideas to test than one little team can do, and anything that's new and different will have its naysayers, even if they're well intentioned. It's great to get through that stage and affect the bigger organization in a positive way.

## **How have you proliferated the lab's mindset throughout the company?**

We offer innovation lab tours where we talk about our practices and process. We have our own version of the Lean Startup Machine, a two-day innovation boot camp that's

open to anyone at the company, where we come up with a challenge and form cross-functional teams. Each team has an innovation coach from the lab who knows design thinking, lean startup, innovation accounting, ethnography, and some other things. We get people out of the building so they can talk to customers, validate ideas, and bring them to the point of being able to pitch to some senior leaders in the company. Some good ideas come out of that, but the real benefit is learning about the process and becoming comfortable with thinking in a new way. A few members of the Innovation Lab started the People Lab, and they're now separately managed to do that type of work full-time.

## **What are the most important guidelines for enterprises to keep in mind to increase their innovation capability?**

The innovation effort needs to be a well supported, well protected venture inside the company. You're asking for cultural change, which is not easy no matter what kind of change you're trying to achieve. While it's rewarding, it's not for the faint of heart nor those looking for another silver bullet of the month.