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Harvard Business Review

MAY 2013
REPRINT R1305C

SPOTLIGHT ON ENTREPRENEURSHIP

Why the Lean Start-Up Changes Everything

by Steve Blank

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Spotlight



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ARTWORK Sara Hughes, *Download*, 2005
Acrylic on linen, 1.5 m x 1.5 m
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Why the Lean Start-Up Changes Everything

by Steve Blank

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Launching a new enterprise—whether it's a tech start-up, a small business, or an initiative within a large corporation—has always been a hit-or-miss proposition. According to the decades-old formula, you write a business plan, pitch it to investors, assemble a team, introduce a product, and start selling as hard as you can. And somewhere in this sequence of events, you'll probably suffer a fatal setback. The odds are not with you: As new research by Harvard Business School's Shikhar Ghosh shows, 75% of all start-ups fail.

But recently an important countervailing force has emerged, one that can make the process of starting a company less risky. It's a methodology called the "lean start-up," and it favors experimentation over elaborate planning, customer feedback over intuition, and iterative design over traditional "big design up front" development. Although the methodology is just a few years old, its concepts—such as "minimum viable product" and "pivoting"—have quickly taken root in the start-up world, and business schools have already begun adapting their curricula to teach them.

The lean start-up movement hasn't gone totally mainstream, however, and we have yet to feel its full impact. In many ways it is roughly where the big data movement was five years ago—consisting mainly of a buzzword that's not yet widely understood, whose implications companies are just beginning to grasp. But as its practices spread, they're turning the conventional wisdom about entrepreneurship on its head. New ventures of all kinds are attempting to improve their chances of success by following its principles of failing fast and continually learning. And despite the methodology's name, in the long term some of its biggest payoffs may be gained by the *large* companies that embrace it.

In this article I'll offer a brief overview of lean start-up techniques and how they've evolved. Most important, I'll explain how, in combination with other business trends, they could ignite a new entrepreneurial economy.

Sketch Out Your Hypotheses

The business model canvas lets you look at all nine building blocks of your business on one page. Each component of the business model contains a series of hypotheses that you need to test.

KEY PARTNERS
- Who are our key partners?
- Who are our key suppliers?
- Which key resources are we acquiring from our partners?
- Which key activities do partners perform?

KEY ACTIVITIES
- What key activities do our value propositions require?
- Our distribution channels?
- Customer relationships?
- Revenue streams?

KEY RESOURCES
- What key resources do our value propositions require?
- Our distribution channels?
- Customer relationships?
- Revenue streams?

VALUE PROPOSITIONS
- What value do we deliver to the customer?
- Which one of our customers' problems are we helping to solve?
- What bundles of products and services are we offering to each segment?
- Which customer needs are we satisfying?
- What is the minimum viable product?

CUSTOMER RELATIONSHIPS
- How do we get, keep, and grow customers?
- Which customer relationships have we established?
- How are they integrated with the rest of our business model?
- How costly are they?

CHANNELS
- Through which channels do our customer segments want to be reached?
- How do other companies reach them now?
- Which ones work best?
- Which ones are most cost-efficient?
- How are we integrating them with customer routines?

CUSTOMER SEGMENTS
- For whom are we creating value?
- Who are our most important customers?
- What are the customer archetypes?

COST STRUCTURE
- What are the most important costs inherent to our business model?
- Which key resources are most expensive?
- Which key activities are most expensive?

REVENUE STREAMS
- For what value are our customers really willing to pay?
- For what do they currently pay?
- What is the revenue model?
- What are the pricing tactics?

SOURCE WWW.BUSINESSMODELGENERATION.COM/CANVAS. CANVAS CONCEPT DEVELOPED BY ALEXANDER OSTERWALDER AND YVES PIGNEUR.

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Idea in Brief

Over the past few years, a new methodology for launching companies, called the "lean start-up," has begun to replace the old regimen.

Instead of executing business plans, operating in stealth mode, and releasing fully functional prototypes, young ventures are testing hypotheses, gathering early and frequent customer feedback, and showing "minimum viable products" to prospects. This new process recognizes that searching for a business model (which is the primary task facing a start-up) is entirely different from executing against that model (which is what established firms do).

Recently, business schools have begun to teach the methodology, which can also be learned at events such as Startup Weekend. Over time, lean start-up techniques could reduce the failure rate of new ventures and, in combination with other trends taking hold in the business world, launch a new, more entrepreneurial economy.

The Fallacy of the Perfect Business Plan

According to conventional wisdom, the first thing every founder must do is create a business plan—a static document that describes the size of an opportunity, the problem to be solved, and the solution that the new venture will provide. Typically it includes a five-year forecast for income, profits, and cash flow. A business plan is essentially a research exercise written in isolation at a desk before an entrepreneur has even begun to build a product. The assumption is that it's possible to figure out most of the unknowns of a business in advance, before you raise money and actually execute the idea.

Once an entrepreneur with a convincing business plan obtains money from investors, he or she begins developing the product in a similarly insular fashion. Developers invest thousands of man-hours to get it ready for launch, with little if any customer input. Only after building and launching the product does the venture get substantial feedback from customers—when the sales force attempts to sell it. And too often, after months or even years of development, entrepreneurs learn the hard way that customers do not need or want most of the product's features.

After decades of watching thousands of start-ups follow this standard regimen, we've now learned at least three things:

1. Business plans rarely survive first contact with customers. As the boxer Mike Tyson once said about his opponents' prefight strategies: "Everybody has a plan until they get punched in the mouth."

2. No one besides venture capitalists and the late Soviet Union requires five-year plans to forecast complete unknowns. These plans are generally fiction, and dreaming them up is almost always a waste of time.

3. Start-ups are not smaller versions of large companies. They do not unfold in accordance with master plans. The ones that ultimately succeed go quickly from failure to failure, all the while adapting, iterating on, and improving their initial ideas as they continually learn from customers.

One of the critical differences is that while existing companies *execute* a business model, start-ups *look* for one. This distinction is at the heart of the lean start-up approach. It shapes the lean definition of a start-up: a temporary organization designed to search for a repeatable and scalable business model.

The lean method has three key principles:

First, rather than engaging in months of planning and research, entrepreneurs accept that all they have on day one is a series of untested hypotheses—basically, good guesses. So instead of writing an intricate business plan, founders summarize their hypotheses in a framework called a *business model canvas.* Essentially, this is a diagram of how a company creates value for itself and its customers. (See the exhibit "Sketch Out Your Hypotheses.")

Second, lean start-ups use a "get out of the building" approach called *customer development* to test their hypotheses. They go out and ask potential users, purchasers, and partners for feedback on all elements of the business model, including product features, pricing, distribution channels, and affordable customer acquisition strategies. The emphasis is on nimbleness and speed: New ventures rapidly assemble minimum viable products and immediately elicit customer feedback. Then, using customers' input to revise their assumptions, they start the cycle over again, testing redesigned offerings and making further small adjustments (iterations) or more substantive ones (pivots) to ideas that aren't working. (See the exhibit "Listen to Customers.")

Third, lean start-ups practice something called *agile development,* which originated in the software industry. Agile development works hand-in-hand with customer development. Unlike typical year-

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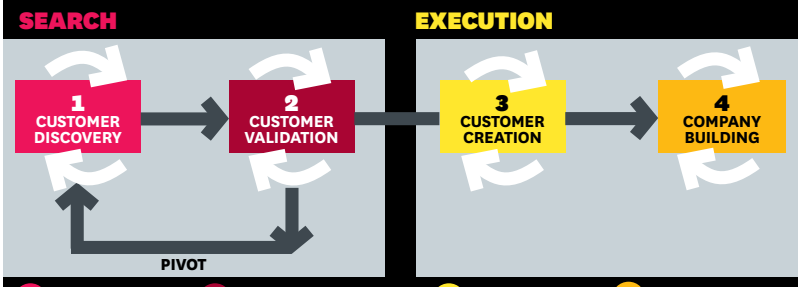
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long product development cycles that presuppose knowledge of customers' problems and product needs, agile development eliminates wasted time and resources by developing the product iteratively and incrementally. It's the process by which start-ups create the minimum viable products they test. (See the exhibit "Quick, Responsive Development.")

When Jorge Heraud and Lee Redden started Blue River Technology, they were students in my class at Stanford. They had a vision of building robotic lawn mowers for commercial spaces. After talking to over 100 customers in 10 weeks, they learned their initial customer target—golf courses—didn't value their solution. But then they began to talk to farmers and found a huge demand for an automated way to kill weeds without chemicals. Filling it became their new product focus, and within 10 weeks Blue River had built and tested a prototype. Nine months later the start-up had obtained more than $3 million in venture funding. The team expected to have a commercial product ready just nine months after that.

Listen to Customers

During customer development, a start-up searches for a business model that works. If customer feedback reveals that its business hypotheses are wrong, it either revises them or "pivots" to new hypotheses. Once a model is proven, the start-up starts executing, building a formal organization. Each stage of customer development is iterative: A start-up will probably fail several times before finding the right approach.



1 Founders translate company ideas into business model hypotheses, test assumptions about customers' needs, and then create a "minimum viable product" to try out their proposed solution on customers.

2 Start-up continues to test all other hypotheses and tries to validate customers' interest through early orders or product usage. If there's no interest, the start-up can "pivot" by changing one or more hypotheses.

3 The product is refined enough to sell. Using its proven hypotheses, the start-up builds demand by rapidly ramping up marketing and sales spending, and scales up the business.

4 Business transitions from start-up mode, with a customer development team searching for answers, to functional departments executing its model.

Stealth Mode's Declining Popularity

Lean methods are changing the language start-ups use to describe their work. During the dot-com boom, start-ups often operated in "stealth mode" (to avoid alerting potential competitors to a market opportunity), exposing prototypes to customers only during highly orchestrated "beta" tests. The lean start-up methodology makes those concepts obsolete because it holds that in most industries customer feedback matters more than secrecy and that constant feedback yields better results than cadenced unveilings.

Those two fundamental precepts crystallized for me during my career as an entrepreneur. (I've been involved with eight high-tech start-ups, as either a founder or an early employee.) When I shifted into teaching, a decade ago, I came up with the formula for customer development described earlier. By 2003 I was outlining this process in a course at the Haas School of Business at the University of California at Berkeley.

In 2004, I invested in a start-up founded by Eric Ries and Will Harvey and, as a condition of my investment, insisted that they take my course. Eric quickly recognized that waterfall development, the tech industry's traditional, linear product development approach, should be replaced by iterative agile techniques. He also saw similarities between this emerging set of start-up disciplines and the Toyota Production System, which had become known as "lean manufacturing." Eric dubbed the combination of customer development and agile practices the "lean start-up."

The tools were popularized by a series of successful books. In 2003, I wrote *The Four Steps to the Epiphany,* articulating for the first time that start-ups were not smaller versions of large companies and laying out the customer development process in detail. In 2010, Alexander Osterwalder and Yves Pigneur gave entrepreneurs the standard framework for business model canvases in *Business Model Generation*. In 2011 Eric published an overview in *The Lean Startup.* And in 2012 Bob Dorf and I summarized what we'd learned about lean techniques in a step-by-step handbook called *The Startup Owner's Manual.*

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What Lean Start-Ups Do Differently

The founders of lean start-ups don't begin with a business plan; they begin with the search for a business model. Only after quick rounds of experimentation and feedback reveal a model that works do lean founders focus on execution.

	Lean	Traditional
Strategy	Business Model Hypothesis-driven	Business Plan Implementation-driven
New-Product Process	Customer Development Get out of the office and test hypotheses	Product Management Prepare offering for market following a linear, step-by-step plan
Engineering	Agile Development Build the product iteratively and incrementally	Agile or Waterfall Development Build the product iteratively, or fully specify the product before building it
Organization	Customer and Agile Development Teams Hire for learning, nimbleness, and speed	Departments by Function Hire for experience and ability to execute
Financial Reporting	Metrics That Matter Customer acquisition cost, lifetime customer value, churn, viralness	Accounting Income statement, balance sheet, cash flow statement
Failure	Expected Fix by iterating on ideas and pivoting away from ones that don't work	Exception Fix by firing executives
Speed	Rapid Operates on good-enough data	Measured Operates on complete data

The lean start-up method is now being taught at more than 25 universities and through a popular online course at Udacity.com. In addition, in almost every city around world, you'll find organizations like Startup Weekend introducing the lean method to hundreds of prospective entrepreneurs at a time. At such gatherings a roomful of start-up teams can cycle through half a dozen potential product ideas in a matter of hours. Although it sounds incredible to people who haven't been to one, at these events some businesses are formed on a Friday evening and are generating actual revenue by Sunday afternoon.

Creating an Entrepreneurial, Innovation-Based Economy

While some adherents claim that the lean process can make individual start-ups more successful, I believe that claim is too grandiose. Success is predicated on too many factors for one methodology to guarantee that any single start-up will be a winner. But on the basis of what I've seen at hundreds of start-ups, at programs that teach lean principles, and at established companies that practice them, I can make a more important claim: Using lean methods across a portfolio of start-ups will result in fewer failures than using traditional methods.

A lower start-up failure rate could have profound economic consequences. Today the forces of disruption, globalization, and regulation are buffeting the economies of every country. Established industries are rapidly shedding jobs, many of which will never return. Employment growth in the 21st century will have to come from new ventures, so we all have a vested interest in fostering an environment that helps them succeed, grow, and hire more workers. The creation of an innovation economy that's driven by the rapid expansion of start-ups has never been more imperative.

In the past, growth in the number of start-ups was constrained by five factors in addition to the failure rate:

1. The high cost of getting the first customer and the even higher cost of getting the product wrong.

2. Long technology development cycles.

3. The limited number of people with an appetite for the risks inherent in founding or working at a start-up.

4. The structure of the venture capital industry, in which a small number of firms each needed to invest big sums in a handful of start-ups to have a chance at significant returns.

5. The concentration of real expertise in how to build start-ups, which in the United States was mostly found in pockets on the East and West coasts. (This is less an issue in Europe and other parts of the world, but even overseas there are geographic entrepreneurial hot spots.)

The lean approach reduces the first two constraints by helping new ventures launch products that customers actually want, far more quickly and cheaply than traditional methods, and the third by making start-ups less risky. And it has emerged at a time when other business and technology trends are likewise breaking down the barriers to start-up formation. The combination of all these forces is altering the entrepreneurial landscape.

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Today open source software, like GitHub, and cloud services, such as Amazon Web Services, have slashed the cost of software development from millions of dollars to thousands. Hardware start-ups no longer have to build their own factories, since offshore manufacturers are so easily accessible. Indeed, it's become quite common to see young tech companies that practice the lean start-up methodology offer software products that are simply "bits" delivered over the web or hardware that's built in China within weeks of being formed. Consider Roominate, a start-up designed to inspire girls' confidence and interest in science, technology, engineering, and math. Once its founders had finished testing and iterating on the design of their wired dollhouse kit, they sent the specs off to a contract manufacturer in China. Three weeks later the first products arrived.

Another important trend is the decentralization of access to financing. Venture capital used to be a tight club of formal firms clustered near Silicon Valley, Boston, and New York. In today's entrepreneurial ecosystem, new super angel funds, smaller than the traditional hundred-million-dollar-sized VC fund, can make early-stage investments. Worldwide, hundreds of accelerators, like Y Combinator and TechStars, have begun to formalize seed investments. And crowdsourcing sites like Kickstarter provide another, more democratic method of financing start-ups.

The instantaneous availability of information is also a boon to today's new ventures. Before the internet, new company founders got advice only as often as they could have coffee with experienced investors or entrepreneurs. Today the biggest challenge is sorting through the overwhelming amount of start-up advice they get. The lean concepts provide a framework that helps you differentiate the good from the bad.

Lean start-up techniques were initially designed to create fast-growing tech ventures. But I believe the concepts are equally valid for creating the Main Street small businesses that make up the bulk of the economy. If the entire universe of small business embraced them, I strongly suspect it would increase growth and efficiency, and have a direct and immediate impact on GDP and employment.

There are signs that this may in fact happen. In 2011 the U.S. National Science Foundation began using lean methods to commercialize basic science research in a program called the Innovation Corps. Eleven universities now teach the methods to hundreds of teams of senior research scientists across the United States.

MBA programs are adopting these techniques, too. For years they taught students to apply large-company approaches—such as accounting methods for tracking revenue and cash flow, and organizational theories about managing—to start-ups. Yet start-ups face completely different issues. Now business schools are realizing that new ventures need their own management tools.

> Lean start-up practices aren't just for young tech ventures. Large companies, such as GE and Intuit, have begun to implement them.

As business schools embrace the distinction between management execution and searching for a business model, they're abandoning the business plan as the template for entrepreneurial education. And the business plan competitions that have been a celebrated part of the MBA experience for over a decade are being replaced by business model competitions. (Harvard Business School became the latest to make this switch, in 2012.) Stanford, Harvard, Berkeley, and Columbia are leading the charge and embracing the lean start-up curriculum. My Lean LaunchPad course for educators is now training over 250 college and university instructors a year.

A New Strategy for the 21st-Century Corporation

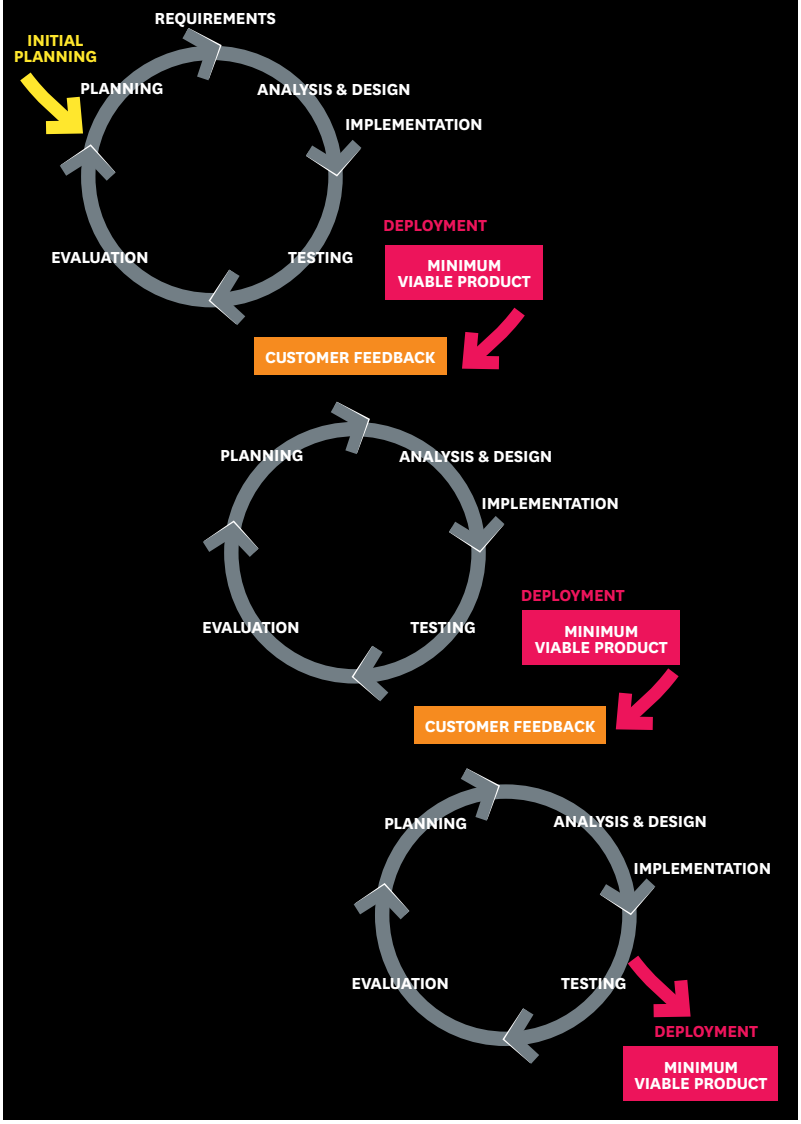
It's already becoming clear that lean start-up practices are not just for young tech ventures.

Corporations have spent the past 20 years increasing their efficiency by driving down costs. But simply focusing on improving existing business

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Quick, Responsive Development

In contrast to traditional product development, in which each stage occurs in linear order and lasts for months, agile development builds products in short, repeated cycles. A start-up produces a "minimum viable product"—containing only critical features—gathers feedback on it from customers, and then starts over with a revised minimum viable product.



models is not enough anymore. Almost every large company understands that it also needs to deal with ever-increasing external threats by continually innovating. To ensure their survival and growth, corporations need to keep inventing new business models. This challenge requires entirely new organizational structures and skills.

Over the years managerial experts such as Clayton Christensen, Rita McGrath, Vijay Govindarajan, Henry Chesbrough, Ian MacMillan, Alexander Osterwalder, and Eric von Hippel have advanced the thinking on how large companies can improve their innovation processes. During the past three years, however, we have seen large companies, including General Electric, Qualcomm, and Intuit, begin to implement the lean start-up methodology.

GE's Energy Storage division, for instance, is using the approach to transform the way it innovates. In 2010 Prescott Logan, the general manager of the division, recognized that a new battery developed by the unit had the potential to disrupt the industry. Instead of preparing to build a factory, scale up production, and launch the new offering (ultimately named Durathon) as a traditional product extension, Logan applied lean techniques. He started searching for a business model and engaging in customer discovery. He and his team met face-to-face with dozens of global prospects to explore potential new markets and applications. These weren't sales calls: The team members left their PowerPoint slides behind and listened to customers' issues and frustrations with the battery status quo. They dug deep to learn how customers bought industrial batteries, how often they used them, and the operating conditions. With this feedback, they made a major shift in their customer focus. They eliminated one of their initial target segments, data centers, and discovered a new one—utilities. In addition, they narrowed the broad customer segment of "telecom" to cell phone providers in developing countries with unreliable electric grids. Eventually GE invested $100 million to build a world-class battery manufacturing facility in Schenectady, New York, which it opened in 2012. According to press reports, demand for the new batteries is so high that GE is already running a backlog of orders.

THE FIRST HUNDRED YEARS of management education focused on building strategies and tools that formalized execution and efficiency for existing businesses. Now, we have the first set of tools for searching for new business models as we launch start-up ventures. It also happens to have arrived just in time to help existing companies deal with the forces of continual disruption. In the 21st century those forces will make people in every kind of organization—start-ups, small businesses, corporations, and government—feel the pressure of rapid change. The lean start-up approach will help them meet it head-on, innovate rapidly, and transform business as we know it.

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