THE POWER OF EXPERIMENTATION

GARY HAMEL AND MICHELE ZANINI

There is nothing more innovative and resilient on our planet than life. Despite meteor strikes, volcanic eruptions, extreme climate shifts, and wandering tectonic plates, life has not only persisted, it has flourished. And, in the process, it has become ever more complex and capable—this despite the fact that in the standard evolutionary model there is no CEO of life, no overseeing agency, no strategic plan.

Life's capacity for adaptation is based on highly complex biochemical processes, yet the design rules for evolutionary "progress" are relatively simple: variety and selection. Life is constantly innovating, constantly producing novel genetic variety through mutation and sexual reproduction—in other words, through experimentation. This is how life insures itself against the unexpected, and over the past four thousand millennia our planet has changed in some pretty unexpected ways. Yet all that change has never outpaced life's capacity to adapt.

THE BUREAUCRATIC AVERSION TO EXPERIMENTATION

Organizations have long run experiments to test the appeal of new products, and in today's digital economy, running speedy, low-cost experiments has never been easier. Firms like Alibaba, Facebook, and Google conduct tens of thousands of experiments each year, testing the impact of small changes to algorithms, user features, and web design. While each experiment may be small, the cumulative impact is not.

For most companies, experimentation is not yet a deep and distributed capability. Here's why.

The vast majority of employees don't have the latitude to launch and run small-scale experiments. In most organizations, the ability to design and run trials remains the province of specialists in R&D, data science, or product marketing. Even for employees in those functions, doing anything more than a narrow A/B test usually requires management approval. It's not surprising that, in our survey of 10,000 *Harvard Business Review* readers, 61 percent of respondents from large companies said it's "very difficult" for frontline employee to try something new when doing so requires a small team and a bit of seed funding. Another 34 percent said that bottom-up experiments are possible only

when someone has the right connections and plenty of courage.

Risk-taking is discouraged. In a 2021 Gallup survey, only 9 percent of employees strongly agreed that they are free to take risks to improve products and services or solutions.[1] A 2018 survey of entry-level employees by Ernst & Young reported that only a quarter think their company is failure tolerant.[2] Managers also feel hemmed in. In the Boston Consulting Group's long-running annual poll of senior managers, a "risk averse culture" and "overly lengthy development times" consistently rank as the biggest barriers to innovation, and the problem seems to be getting worse.[3] In a 2015 Accenture survey of US executives, two-thirds said their organization was becoming more risk averse to pursuing new ideas, up from 46 percent in 2012.[4]

Few companies teach people how to experiment. The evidence here is anecdotal, but if you're skeptical about our claim, take a moment to visit your company's learning portal. Among all the courses offered on compliance, soft skills, and time management, can you find any on designing customer experiments or rapid prototyping? Probably not. Few companies regard frontline employees as members of a company-wide research team.

Given these obstacles, it's not surprising that "lean startup" practices have struggled to gain traction in large companies. While few would argue with the logic of launching minimum viable products to test leap-of-faith assumptions, not many companies have in fact mastered these tools. Stanford professor Steve Blank, whose 2013 *Harvard Business Review* article extolled the virtues of lean startup, was forced to conclude four years later that the methodology had "changed nothing."[5]

Like the idea of self-managing work groups in the 1970s and agile teams more recently, the lean startup credo got shredded by the bureaucratic woodchipper. If you've spent any time in big companies, you would have seen this coming. Bureaucracies are set up to produce maximally reliable products, not barely working prototypes. Deviations from standard practice are to be eliminated, not celebrated. Ask a bureaucrat to run an experiment and their palms begin to sweat. An

ABOUT THE AUTHORS

Gary Hamel has been on the faculty of the London Business School since 1983 and has been ranked by the *Wall Street Journal* as the world's most influential business thinker. He has written 20 articles for the *Harvard Business Review,* and his books have been translated into more than 25 languages. Hamel's latest book, *Humanocracy: Creating Organizations as Amazing as the People inside Them* (co-authored with M. Zanini), is a *Wall Street Journal* best seller.

Michele Zanini is a co-founder of the Management Lab, where he helps large organizations become more adaptable, innovative, and engaging places to work. He was previously a consultant at McKinsey & Company and a policy analyst at the RAND Corporation. He is the co-author of *Humanocracy* (with G. Hamel). Zanini's work has been featured in the *Harvard Business Review, Financial Times,* and *Wall Street Journal.*

experiment is a risky bet on the unknown, a banana skin likely to land you on your ass. What reward is there in running something that is more likely to fail than succeed? Better collective paralysis than personal humiliation.

Even the word "experiment" is problematic, pregnant as it is with the potential for calamity. Have you ever heard a senior HR or finance executive proclaim that they're about to launch an experiment? Or your CFO? Probably not. Instead, they talk about running pilots. When you run a pilot, you're fine-tuning for perfection. You already have 90 percent of the solution—or assume you do. When you run an experiment, anything could happen. Yet as Amazon founder and executive chairman Jeff Bezos points out, "If you know in advance that it's going to work, it's not an experiment." So, conventional thinking goes, if you *must* experiment, sequester the test in an R&D lab or an incubator to contain the fallout. And above all, make sure that only a few people have permission to fail.

The allergy to risk is aggravated by investment screens that filter out high-risk project, where "high risk" means anything that doesn't have a 90 percent or better probability of paying off. While that sort of prudence may make sense for a major capital project, it's idiotic for a scrappy experiment. The math is so simple as to be embarrassing. The downside risk of a $100 million dollar project with a 10 percent chance of failure is $10 million. The downside risk of a $5,000 experiment with a 90 percent chance of failing is $4,500. Despite the trivial sums involved, there aren't many organizations where you could get funding for an experiment, however modest, if you told your boss your idea had only a 10 percent chance of working, whatever the potential upside. Winning approval gets even harder when the experiment lies outside your boss' experience. Executives regularly mistake ignorance for risk: an experiment *seems* risky not because it is but because the gatekeeper is unfamiliar with the technology or the targeted customers. It's crazy that, in most organizations, a CEO has an easier time getting a $100 million project through the board than a frontline operator has getting approval for a $1,000 experiment.

Perversely, the desire to avoid risk often magnifies it. Dumping money into "me-too" projects that offer only modest gains is a lot more perilous than carefully seeding ideas that are further out on the fringe. Executives need to acknowledge that incrementalism is often the riskiest bet of all.

Overcoming the bureaucratic aversion to pervasive, bottom-up experimentation requires a shift in how we think about experimentation. The goal isn't simply to reduce the uncertainty around a new product or get it to market faster; experimentation is how an organization buys insurance against irrelevance.

AN EVOLUTIONARY ADVANTAGE

British psychiatrist Ross Ashby was a pioneer in cybernetics, the study of regulatory systems. In 1956, he formulated the "law of requisite variety," which would become one of the seminal ideas in systems theory. The law states that, for a system to remain viable, it must be capable of generating a range of responses as diverse as the challenges posed by its environment. To put this in our terms, if there are a lot more game-changing ideas being tested outside your organization than within it, it is running the risk of being superseded. As Ashby put it, "only variety can absorb variety." That's why a business needs to generate and test hundreds or even thousands of ideas a year, recognizing that most will fail.

Here's an analogy. A mature oak tree can drop as many as 10,000 acorns in a season. All those nuts constitute a search

strategy. The oak tree doesn't know where to find the most fertile ground, but by producing thousands of nuts it raises the odds that a few lucky ones will land in exactly the right spot to germinate. Even then, the oak tree needs help. Squirrels bury hundreds of acorns but retrieve only about 25 percent of their cache.[6] By dispersing the nuts, the oak tree's fluffy little helpers further increase the odds of germination. While vice presidents are smarter than trees, they also struggle to pinpoint growth opportunities, not least because the search area for an organization is incomparably larger than it is for a tree. The chance of finding the next big opportunity—and staying relevant—is a numbers game.

Venture capitalists (VCs) get this. A typical venture capitalist may look at a thousand prospective business plans over the course of a year and interview a hundred or so would-be entrepreneurs before investing in a dozen startups. The VC knows that the modal return on investments within the portfolio is likely to be zero. Of the dozen startups, most will return nothing—they will never cash out via an acquisition or IPO and thus never return any money to the VC's limited partners. A study of 1,098 startups that got their first round of funding between 2008 and 2010 confirms these odds. By 2017, 70 percent of the new ventures had gone out of business or were barely self-sustaining. Only one business in 20 had been acquired or gone public with a valuation of $100 million or more, and just five businesses, or 0.45 percent of the total, had achieved a valuation of a $1 billion or more.[7]

VCs invest in a portfolio of experiments. While most of their bets will return nothing, the hope is that one or two will be the next Airbnb or SpaceX. This is how the average return can be positive, even though the modal return is zero. In our experience, most companies fail to appreciate the distinction between project risk and portfolio risk. Each potential experiment gets evaluated on its own merits and is expected to clear a high bar of feasibility. This pretty much ensures that the company will never invest in the sort of crazy ideas that occasionally deliver a 1,000-fold return.

What's true in biology is equally true in business: the pace at which your organization can adapt is a function of the number and variety of experiments it conducts. Experimentation is how you build an evolutionary advantage.

THE ETHOS OF EXPERIMENTATION

Few organizations have embraced experimentation as wholeheartedly as Amazon, arguably the world's most innovative company. Amazon's breakthrough innovations include Amazon Marketplace, the company's platform for third-party sellers; Kindle, the world's most popular e-reader; Amazon Web Services, the runaway leader in cloud computing; Alexa, Amazon's voice-assistant; and Amazon Go, an experimental grocery store with no checkout lines. Behind these headline-grabbing innovations are hundreds of less-noticed innovations, such as frustration-free packaging, an initiative designed to reduce excess packaging that has thus far eliminated 215,000 tons of packaging and saved 360 million shipping boxes.

Amazon's relentless growth isn't the product of a few brilliantly conceived top-down initiatives but of a culture that encourages relentless bottom-up experimentation. "Our success," says Bezos, "is a function of how many experiments we do per year, per month, per week, per day." One such experiment was Greg Linden's early attempt at building an e-commerce recommendation engine for Amazon. Not long after joining the company in 1997, Greg was wondering whether it might be possible to entice customers into making the sort of impulse buys that supermarkets encourage by lo-

cating candy, refrigerated drinks, and other small items near checkout counters. Greg reckoned that Amazon could use its vast trove of data to offer a unique assortment of appealing items to every customer. Soon Greg had mocked up an Amazon.com shopping cart page that included a cluster of customized recommendations. Greg's colleagues were generally enthusiastic about the idea, but an influential vice president objected to the plan. Worried that the proposed feature would complicate the checkout process, he ordered Greg to shelve the idea. In most companies, the story would end there, but Greg knew that Amazon valued data more highly than opinions, so he pressed on. When the test finally launched, the results were immediately positive. Customers loved the tailored advice and the revenue bump was substantial. Today, roughly 35 percent of Amazon's retail sales are generated by site recommendations. Greg's breakthrough earned him the company's revered "Just Do It" award—a used Nike sneaker personally presented by Jeff Bezos.

The experience taught Greg a critical lesson, as he would later write: "Everyone must be able to experiment, learn, and iterate. Position, obedience, and tradition should hold no power. For innovation to flourish, measurement must rule." Can you imagine your CEO exhorting everyone to experiment or commanding vice presidents to bow before experimental data? Probably not, but until this happens, your company won't be as innovative Amazon.

Experimentation requires patience, a virtue conspicuously absent in most bureaucracies. What's often missing is a sense of purpose. You need a cause to carry you through the failures. Alphabet subsidiary Waymo has been sustained in its 10-year quest to develop autonomous vehicles by the promise of safer, more efficient transportation. Thomas Edison's efforts 140 years ago to develop a commercially viable lightbulb were buoyed by his passion for lighting up a dark world.

Experimentation comes naturally when you're passionate about making a difference in the world. At Amazon, Bezos credits the company's customer-obsessed culture for creating the incentive to "experiment patiently, accept failures, plant seeds, protect saplings, and double down when you see customer delight." Put simply, when you're on an epic quest, failed experiments don't crush your spirit.

Firms like Amazon can hold their own against a throng of startups because they have thousands of internal entrepreneurs who are swarming the landscape looking for promising opportunities. Though they've grown big, they've stayed true to the entrepreneurial mantra of "fail fast, learn fast."

Experimentation isn't just for software companies and online retailers. Toyota's Japanese employees contribute more than a million improvement suggestions each year. Most of these suggestions are more than mere ideas; they're reports on experiments that have already produced results, and 95 percent of the suggestions get approved for rollout. The economic impact? More than $2 billion annually in increased productivity.

Amazon and Toyota show what's possible when you view the entire organization as a lab. These companies understand that you can't lock the tools of experimentation in a shed, accessible only to those in R&D or new product development. Prototyping—the power tool for experimentation—needs to be a company-wide competence. The ethos needs to be "show me," not "tell me." Build a Styrofoam model, sketch it on a napkin, lay out a storyboard, shoot a video. The sheer act of translating a concept into a thing often reveals hidden flaws and/or opportunities to make the idea better. That's why everyone needs to be a maker. Roll up your sleeves, get your hands dirty, build something!

Doing so activates a brain-body connection that helps you look at your idea differently and understand it more deeply. More importantly, it gives customers and colleagues something they can react to.

The seeming profligacy of experimentation—look at all those wasted acorns!—bucks the nettles of the bureaucratic mindset. Surely, with enough smarts we ought to be able to zero in on the winners and avoid the dead ends. If only. Amazon and Intuit are hardly filled with dullards, yet they know that even the smartest people in the world can't find the future sitting at their desks.

If you're ready to turn your organization it into an "exploratorium," here's an initial to-do list.

1. Build a shared commitment to increasing the number of experiments your organization runs each year by 10- or 100-fold. Set provisional targets for the number of experiments every team, department, and business unit should run each year. A goal of one experiment per employee per year is a good place to start.
2. Equip every individual with the skills they need to design and run their own experiments. There's plenty of courseware out there on design thinking and rapid prototyping. Make it accessible to everyone in your organization. You can't ask an employee to go digging for opportunities if you haven't given them a pick and shovel.
3. Encourage people to build experiments rather than to craft elaborate plans, and make this a prerequisite for getting seed money. If someone doesn't care enough about an idea to build something, don't invest.
4. Remove barriers that make it hard for team members to fund and launch experiments. Starting with your own team, create a small budget for experimentation. Encourage those who work for you to set aside a few hours every week to pursue new ideas.
5. Require every staff group to report monthly on how they're supporting local experiments and on what they're doing to make it easier for frontline teams to try new things.
6. "De-risk" the personal consequences of experiments gone wrong. Remind people that most experiments will fail. Make sure team members get career credit for their experiments, whatever the outcome.
7. Hold every leader at every level responsible for mentoring employee experiments. Make support for experimentation a key component in promotion decisions. Ask employees to rate their managers on the extent to which they create an environment conducive to risk-taking and experimentation.

Life doesn't sit still, it doesn't wait for a catastrophe, it doesn't ask permission, it doesn't plan—it just tries stuff. The same needs to be true of your organization. That means letting people be as experimental at work as they are in the rest of their lives. In the words of the great management theorist Elvis Presley, it's time for "a little less conversation and a little more action." For God's sake, just *try* something.

---

1 Responses are from nonmanagerial, full-time employees who participated in Gallup's Great Jobs Survey (2021).

2 Thibodeaux, W. (2018, May 28). Only 1 out of 4 American workers feel they have permission to fail at work. *Inc.* https://www.inc.com/wanda-thibodeaux/only-1-out-of-4-american-workers-feel-like-they-have-permission-to-fail-at-work.html

3 *The Most Innovative Companies 2018.* (2018). Boston Consulting Group.

4 Innovation: Clear vision, cloudy execution [Innovation survey]. (2015). Accenture.

5 When startups scrapped the business plan.

(2017, August 3). *Harvard Business Review IdeaCast*. https://hbr.org/ideacast/2017/08/when-startups-scrapped-the-business-plan.html

6 Researchers tackle the nutty truth on acorns and squirrels. (1998, November 26). *Science Daily*. https://www.sciencedaily.com/releases/1998/11/981126102802.htm

7 *Venture capital funnel shows odds of becoming a unicorn are about 1%* [Research brief]. (2018, September 6). CB Insight.