INNOVATION LABS

Getting started.
Managing them.
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INNOVATION LABS

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Introduction

What exactly is an innovation lab?

Ask ten companies, and you'll get ten different answers. (At least.)

But we increasingly see large companies creating something they call a lab as a way to cultivate and test new ideas, separate from the demands and pressures of the business units. More often than not, they exist within companies that haven't traditionally had research and development teams. And they typically have some kind of "showcase" element to them – they're intentionally designed to look and feel different from the rest of the company, serving as a place to expose employees to new tools, approaches, and technologies; to bring in outsiders like entrepreneurs or customers for collaboration; or to help with recruiting.

But to achieve impact, innovation labs need to be much more than a Google-esque showcase full of bean bags, espresso machines, and whiteboards. They need:

- A clear mission, which can evolve over time
- Proper staffing and resources to pursue that mission
- Support from senior management
- A way to communicate with and test ideas with actual customers
- Strong relationships with business unit executives who will eventually bring projects to market
- A way to measure results, if they hope to survive over the long-term.

Smyers

To understand how those elements actually get put in place in real companies, and how labs can generate real value, we've spoken to more than 20 executives who run innovation labs over the last six months. (We've also included at the back of this report a collection of recent articles and interviews from Innovation Leader's website on this topic.)

One of the longest-running, and largest, labs we spoke to was Fidelity Labs, part of privately-held Fidelity Investments in Boston. It was started in 1998, and has more than 100 dedicated employees. The mandate, says Fidelity Labs vice president Rick Smyers, is "incubating products and services and entirely new businesses."

At Royal Dutch Shell, with 94,000 employees and $265 billion in revenue, Shawn Murphy of the Shell TechWorks lab says that "our primary mandate is to bring technologies, methodologies, and entrepreneurship from outside oil and gas to the larger group."

There is no standard recipe for creating an innovation lab, and at many companies there may not be the resources or motivation to start one. But where we found labs that are working well, they can help to keep the business looking ahead, exploring new technologies and business models, defending markets, building skills among employees and loyalty among customers, and sustaining a company's competitive advantage.

There are plenty of potential pitfalls to avoid.

"I've seen a lot of businesses in which a lab gets started and they're not clear what the goals are," says Smyers. "Focus on things that really matter. Work on something that's critically important to your business, or a customer segment that is important."

Murphy

Murphy says one of the biggest challenges for a lab is what he terms "the Valley of Death," that place between a proof-of-concept trial, a startup's prototype, or an academic experiment, and an actual commercial product. "99 percent of all products die in this valley," he says. Getting through it "is one of those holy grails. It takes a lot of different pieces, but that's the greatest mandate for the company."

At MasterCard Labs, "we're not guys in white coats doing deep research," says Oran Cummins. Instead, the focus is on building businesses around and beyond a payment transaction. "It's very product-focused. We do enjoy exploring and researching new technologies, but we are definitely not a toy factory or PR engine."

Every company will be situated at a different point of the "innovation urgency" spectrum, and that may affect the organizational support and resources available to a lab. Shell, which in 2015 responded to falling oil prices and profits by laying off thousands of employees, is on one end. MasterCard may be close to the other. As Cummins says, "It's difficult, because our core business is very strong, so we don't have a burning platform. Some companies need to get to that next thing or they die – innovate or die. We're not in that context."

Establishing the mission

Ahmad Bahai worked in one of the great R&D labs of the 20th century: Bell Labs, where the transistor was invented.

"I've seen many world-class labs in the past and how they work," says Bahai, now Chief Technology Officer at semiconductor giant Texas Instruments, and director of the company's network of Kilby Labs. "There's no standard, classic formula...that works for every company. Every company has its own DNA, its own structure."

But Bahai adds that the highest-impact labs have promoted "interaction with others" outside the company – especially customers – as a way to discover and understand problems and opportunities.

With about 100 employees in Dallas, Silicon Valley, India, and Europe, Kilby Labs is separate from Texas Instruments' traditional research and development activities. Named for Jack Kilby, a TI engineer who made history in 1958 when he invented the integrated circuit, Kilby Labs are "high-risk innovation centers focused on delivering breakthrough technology," according to the TI website. "Engineers submit ideas for projects that wouldn't typically be explored inside a business unit, and those who get the green light then have an opportunity to experiment, innovate and push the boundaries of technology in an environment that's one step removed from day-to-day business demands." Projects at Kilby Labs can stretch from six months to more than a year, and successful ones graduate from the labs and move into TI business units, which continue to develop them and shepherd them to market.

Bahai says there are four pillars of Kilby Labs:

Bahai

1. We make sure our innovation journey starts with understanding the problems. A lot of top researchers are very good at coming up with good ideas and exciting solutions, but if problems aren't well-identified, solutions just become a nice idea, but it doesn't have an impact. Understanding problems happens through many different interactions with universities, with users of our technologies, with business and product lines.
2. Working with problems that have two specific attributes:
   - » They have to be highly impactful [to a broad range of people,] because sometimes a problem is local and specific to one application or to one customer. And then I don't think a research lab is the most effective way to handle those – there are so many other organizations within the company [that can address those problems.]
   - » It also has to be inherently risky, in the sense that the risk and the reward are high enough to justify the advance work on it. Because of these two reasons, the fact that the risk is very high, it's usually difficult for a product line [to address this kind of problem, since they have] tangible, short-term financial goals. Because as rewarding as they are, they have this inherent, distinct level of risk, and it makes it difficult for [product lines to take it on.]
3. Metrics: The next step that's extremely important is tangible metrics, which in many cases were missing in the [way] research labs [worked in the past.] How do you measure success of a research lab? Because you can always make progress. With talented people you can always make good progress, but ...unlike a product line, which can measure performance by dollars, in research labs, ideas aren't immediately transferring to market or products...so we need to make sure we have tangible metrics. These metrics may vary from one company to the other.
4. Combining fresh talent with experienced talent. The right combination of fresh top talents and good experienced people is an amazingly powerful engine for innovation. You need to think out of the box and be a risk-taker by injecting new ideas from fresh new minds, but you don't want to re-learn the lessons you've already learned. [At any given time, Kilby Labs has about 100 academic interns and visiting researchers.]

How is TI's network of Kilby Labs, launched in 2009, different from the company's traditional R&D activities, which take place in what the company calls "Systems and Applications Labs"? Bahai says that those traditional R&D activities tend to be focused on existing product lines. "Topics that Kilby works on are very high-risk, high-reward," he says, like new approaches to energy efficient electronics, smart automotive lighting, collision-avoidance systems for cars, and new kinds of low-power sensors for medical applications.

At MasterCard, the initial directive to create MasterCard Labs came from the CEO about five years ago. Oran Cummins, Global Head of R&D for the labs, says that it was to "go and create an R&D arm. That was it – that was the extent of the brief." One big opportunity, as Cummins describes it, is displacing cash. "Eight-five percent of all payments are not electronic. We're very ambitious in terms of...moving from being

an enabler of payments to a facilitator of commerce. This is a big focus of MasterCard Labs." One area of exploration is the smart home and connected appliances; in January 2016, the company unveiled "Groceries by MasterCard," an app that allows consumers to shop and pay for groceries directly from a new Samsung refrigerator.

Cummins

"I think there's a huge opportunity to disrupt how consumers shop...as appliances within the home get smart and more engaging," Cummins says. Another area of exploration is how the smartphone will continue to make consumers' "lives a little bit easier, specifically in restaurants," where paying for a meal can still take too much time.

Cummins says MasterCard uses the "RWW" test for new ideas and technologies: "Is it real? Can we win? Is it worthwhile? We evaluate things very quickly, but it ultimately boils down to, 'Do we believe in it, and do we believe it's strategically important for MasterCard?'"

In 1988, the cable television industry created CableLabs, a non-profit R&D consortium, as a way to share R&D costs around projects that would benefit all of the members, while avoiding antitrust issues. "We focus on the science and technology," says CEO Phil McKinney. "We don't do pricing, market segmentation, or coordination of go-to-market plans." CableLabs focuses on technologies that are three to eight years away. "Our scope is beyond the normal planning horizon for the cable industry," McKinney says.

"The CEOs [of our member companies] look at CableLabs as a resource for them directly," McKinney says. "One thing they get is deep technical expertise that the CEOs can talk with. We may have the CEOs bring their entire management teams into our offices. They'll present their strategies and ask for our feedback. They might present what their technology roadmap looks like. That's all in addition to the R&D work we do developing next-generation technologies that will ultimately turn into products and services that the CEOs can take to market."

At media giant Thomson Reuters, Mona Vernon, VP of the Data Innovation Lab, explains her mission as "customer engagement and rapid prototyping – bringing the customer into the fold of our innovation thinking and validating opportunities. We also tap into the outside world by working closely with academics and startups."

At Neiman Marcus, Enterprise Architect Scott Emmons says that the retailer's lab has focused on in-store innovations during its first three years of existence (it was founded in 2012.) But "one of the goals for 2016 is to be more involved in the online side of the equation as well." He says his approach is not to "own innovation" at the company, but rather to help "nurture it."

The German software company SAP, which has nearly 300,000 customers in 190 countries, created a Co-Innovation Lab (COIL) in 2007. The mission is "all about providing partners of SAP a structured and guided global approach to producing innovative solutions that have a shorter time to market, with reduced risk," says David Cruickshank, senior director of strategy and operations at COIL.

"Co-innovative solutions are meant to tackle problems that a single firm would not or could not take on alone," he says. "You think about the complexity of trying to take advantage of IOT [Internet of Things] technologies to gain actionable insights. There's a lot of moving parts to that puzzle, and it's something that no one company is going to solve for." Some COIL projects have involved as many as seven different

partners working together.


Shewmaker

In 2015, the Minneapolis retailer Target had just become a research sponsor at the MIT Media Lab. That led to the creation of coLab, a small outpost in Cambridge, Mass., overseen by Entrepreneur-in-Residence Greg Shewmaker. Explaining the focus, Shewmaker says, "We know less about our food than we ever have. We want to do something about it. I don't want to sell more Greek yogurt or healthy food. I want to do something big." The coLab, created with the design firm IDEO (working pro bono), is a way for Target to create "a new blueprint for innovation" by collaborating with students and entrepreneurs from around the country to create independent new ventures that Target may fund or help bring to market. The filter Target is using for coLab participants is ideas and businesses that "empower people to know what they're putting into their bodies, or give you more and better options for food," Shewmaker says.

The first coLab event, in November 2015, was a "make-a-thon" that attracted 100 participants. Most coLab events so far have included a weekly "open share," when the teams involved present what they've been working on to each other – and people from the community who visit the coLab space. Target executives from headquarters also sometimes stop by. The coLab will eventually host several "startups in residence."

A lab's mandate doesn't have to be established on Day One, says the lab director at a major regional bank. "We were deliberately pretty vague in the mandate [at first.] Part of getting going with the lab was helping the rest of the organization understand what the mandate would be, and trying to figure out the level of resourcing and the strategic plan for it. It took us three or four months to do that. It culminated in a...two-hour workshop with the board of directors, where we set out the plan to take all of the data of the bank and try to build some automation technology with it using data science as the backbone of the opportunity. How can we automate what's being done today [by] people using software and models?" This executive says that creating the lab's mandate "was almost entirely upwards-facing," working with the CEO, president, and the board. "For better or for worse, we didn't involve a ton of the [people at] the lower levels of the bank in that process."

That labs team is focusing on new products and new technologies, and "building new stuff," and not so much on working with customers or academia.

Eventually, the bank decided to commit about one percent of its revenues to the labs initiative over the course of two to three years. By the end of that period, "we should have a thumbs-up or thumbs-down about the experiment," the lab director says.

Who staffs them?

If a lab group wants to be competitive in hiring outside talent, it will need to create its own identity and culture. As the aforementioned executive in the banking industry says, "We wanted to be able to hire people who were already entrepreneurs and who already knew the ropes for what it takes to build in a 'minimum viable product,' iterative kind of way. [But] it's really tough to hire entrepreneurs into a bank. A key decision was creating a separate identity for the lab that people we hired could identify themselves with." The labs group has its own workspace within headquarters, set up to feel open and collaborative, as well as its own website with team member bios, and information about applying for a job.

"It's funny," he says. "After we hire people, inevitably a month after they get on board they're like, 'I don't really know how I got here. I don't know why I'm working for a bank. I never really expected to work for a bank. This is cool and I'm glad I'm here. I just don't really know how I got here.' I guess that's a sign that we're doing our jobs right."

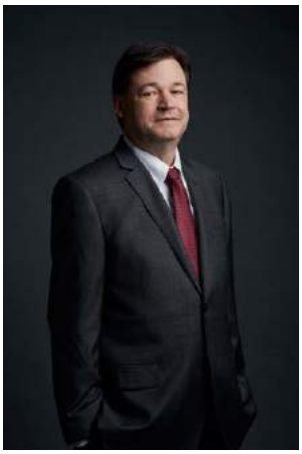
Fidelity Labs had more than 100 employees in late 2015. "We've grown a little bit, and we are in the process of hiring," Smyers says.

"We have a variety of different roles," he continues. "When it was started [in the late 1990s, the focus] was research and development. Now, we have human-centered designers and business analysts. Everything you need to build a product or service. We also have some folks who are focused on outreach to the business units. We have a team that brings in seminars that we think are important for Fidelity employees. We have people who organize hackathons," and a group of about a dozen people who teach design thinking to employees. "Customer experience is a subjective thing, and design thinking is a great way to get into their shoes," he explains. (Fidelity worked with Stanford University's d.school to initially put the design thinking program in place.)

Smyers can envision Fidelity Labs growing to 120 or 130 in the near-term. But he cautions, "We want to be careful. There's a long history of labs that grow too fast." A key question: is there sufficient demand from the business units for the kinds of projects and training programs Fidelity Labs is delivering? "Be very clear about...your business value," he advises.

At Texas Instruments, which has about 31,000 employees in 35 countries, Bahai says that he feels like "about 100" people at Kilby Labs is "the size that is very healthy for a company like TI... I think if a research center gets way above those numbers, it's going to have a bureaucratic agenda and become a little detached from the main body of the company. Most people work in Kilby for a few years until they graduate with their projects to a product line and will be replaced by new talents."

Bahai says that most of Kilby Labs' recruiting is focused on "fresh PhDs from top universities who have been working with us during their PhD education." But some lab staffers also are "experienced people within the company who've expressed interest."



Emmons

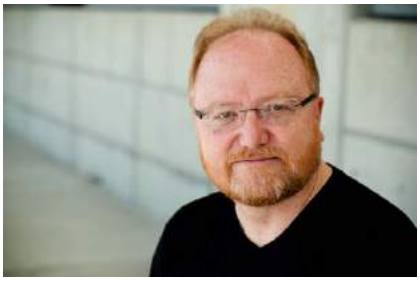
The innovation lab at Neiman Marcus has a staff of one: Scott Emmons, the lab head and an Enterprise Architect at the Texas retailer. "I rely on partners from across the business and also our vendors to assist me on delivering and completing projects. Sometimes I may engage an internal team to build something for me. Sometimes I might engage a third-party to partner with me and to go build a proof-of-concept that we can then go show to the business and try to get buy-in on funding to build the real thing."

In Silicon Valley, SAP has four people working full-time on its COIL team. But about 50 people work at all 13 of the COIL locations around the world, Cruickshank says. "Our team realized a long time ago we would not be a lab globally staffed with all the subject matter and domain experts needed to drive the kinds of co-invention work that we do. So...we do this rich knowledge brokering not only within SAP, but across the ecosystem," finding people with the necessary skill sets to assist with specific projects.

At CableLabs, the staffing level initially was just two people in 1988 (one of whom still works there.) It

grew to about 210 people in late 2015, most of whom are based at CableLabs headquarters near Boulder, Colorado. (In early 2016, CableLabs laid off 27 employees, which McKinney said in a blog post would allow the organization to hire people with different skill sets and focus on "longer range innovation.")

"The quality of the people that we hire is absolutely critical," says McKinney, who joined the organization in mid-2012. "When we went out to find someone to run our wireless R&D group, the job requirement to the recruiters was that it had to be one of the top five people in the world in wireless. We hired Peter Smyth, who ran wireless research for BT Research in the UK."



McKinney

Creating the right set of incentives and rewards for this high-level talent is crucial, he adds. "Some people are motivated by money. We expect long hours, [and] we're under constant pressure to do something new and different. I view the salary and bonuses we pay as compensation to the family. That only takes care of half of the equation. How do I motivate the employee?" In the tech world, McKinney says, the work must be meaningful – and it actually needs to see the light of day.

"When I was at HP, the best thing I could do for an engineer was to ship their product," he says. "If they can take their family into a Best Buy store and point to a product, and say, 'I did that product and I kicked ass,' that is rewarding. For anybody in the R&D or innovation world, just doing work that gets put on a PowerPoint slide, that gets filed away and nothing ever happens – it's not very motiving." McKinney also says that allowing engineers to blog publicly about the work they do, something CableLabs has begun to do over the last few years, is something they appreciate. "A lot of the press follows their blogs," he says. "We allow our engineers to share their thinking, their best work, things they're doing."

The labs chief at a major retailer told us that he found that hiring entrepreneurs can be unwise: sometimes their "rogue" mentality doesn't translate to intrapreneurship. "It's like [you need to find people with] this weird mixture of having the entrepreneurial vision, and view, and make-it-happen mentality, but also at the same time, [you need someone who is] able to work within a pretty complex and process-driven organization."

Vernon at Thomson Reuters says she has had similar experiences: "I don't think it's a lack of motivation. It's just the skills required to, for instance, coordinate with global customers from China to Singapore to Boston across very complex product lines that are managed by a lot of different people. That level of coordination is something that seems really frustrating to someone who's [accustomed to] building a small team and growing that..."

Others echo that notion: a key skill required for innovation labs is the ability to persistently interact with and influence colleagues throughout the organization in all directions – up, down, and horizontally.

But an executive in the healthcare industry says that "we love folks who have entrepreneurial experience [from working at or with] start-ups, and who are familiar with agile and lean [startup approaches.] We think about it like we're not assuming people are going to spend over fifteen years in our lab." He says that you just need to be OK with those hires following a project out of the labs and into a business unit, or moving on to another company at some point.

Of the 75 people who work at Shell's TechWorks group in Cambridge, Mass., "only one or two people come from oil and gas," says Murphy. "All the rest are from robotics, from NASA, from Draper Labs, from Raytheon, from data storage companies like EMC. It's truly a remarkable breadth of people from all over the place."

Structure and governance

Some lab chiefs with whom we spoke report up to a senior R&D leader; others to a chief information officer. A relatively new lab at a bank has twice-a-week check-ins with the President and CEO at the bank, and a quarterly report to the board. "It's pretty informal," says the executive who runs labs there. But "having the report-out to the board, I think, gives everybody the confidence that if we're not seeing the ROI that we want, or it's not feeling like it's going in the right direction," board members will be able to raise and discuss those issues before things go too far.

At Fidelity, the labs group reports to the President of Enterprise Services, who reports directly to the CEO. It is a central resource, "the company's center for innovation," as Smyers puts it. "The whole point of this group is to stay a little bit ahead." At Neiman Marcus Group, the NMG Innovation Lab reports up to the Vice President of Infrastructure and Operations, who reports to the Chief Information Officer. That executive, Michael Kingston, originally started the lab in 2012.

"We didn't build this huge outside organization separate from the business," says Emmons, who leads the lab at Neiman Marcus. "It was embedded right into the mainstream existing business. This allows us to act as a connecting point for all the existing business units, and offers us some flexibility and advantages in terms of expenses and that sort of thing." Emmons says that while he technically reports to one person, "I have a lot of dotted lines, a lot of calls-to-action and to-dos from the executive team."

'You don't want to go off and do science projects that don't have any relevance for driving revenue, but you also don't want to be led by just what is going to happen this quarter.'

Cruickshank at SAP talks about his COIL team as "the glue between SAP's partner organization" – the firms that sell, customize, and service its software – "and the product side of the house. We're the interface to both sides, so we always try to find a way to make sure those two groups are aligned and working together. You don't want to go off and do science projects that don't have any relevance for driving revenue, but you also don't want to be led by just what is going to happen this quarter."

When Royal Dutch Shell created Shell TechWorks in 2013, director Shawn Murphy says he had three models:

1. A "skunk works"-type organization, patterned after Lockheed Martin's Skunk Works, which develops new types of military aircraft.
2. Draper Labs, a non-profit research laboratory where Murphy had worked before joining Shell.
3. A Xerox PARC-type organization that would conduct early-stage research and interact with universities.

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