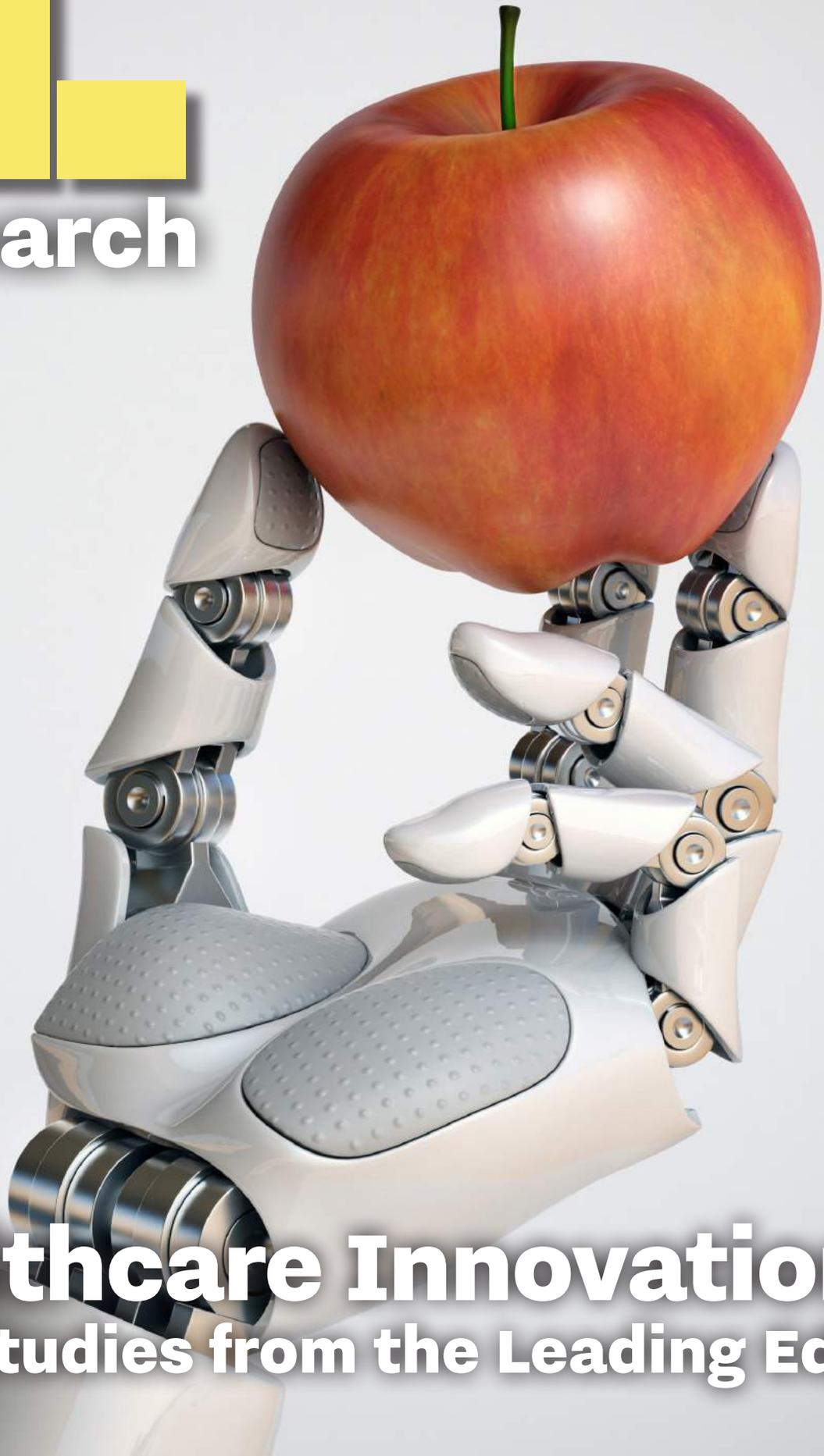


Research



Healthcare Innovation: Case Studies from the Leading Edge

A Letter From Our Sponsor

Making change happen in healthcare is difficult. Sometimes it can seem nearly impossible. It is no longer acceptable to just be different or beat your “competitor.”

We need to do things different and in new ways. This is our primary focus at the Nason Group. We’ve had first-hand and client experience working with complex health systems, payers, and disruptors in this space.

We wanted to partner with Innovation Leader in supporting this collection of case studies to hopefully help your team, leaders, and organizations chalk up some wins, and bring new products or solutions to market.

We’d love to hear from you about the challenges, problems, or new ideas you’re working on...or to send you a free copy of “The Power of Yes! In Innovation,” our new book. Additionally, we would love to hear your stories about your journey to the consumer, member, or patient and how you are putting the “human” back in care.

SHAWN NASON

Founder & CEO, Nason Group

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MEETING PEOPLE WHERE THEY ARE

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Introduction



The healthcare sector, at its heart, is built on a foundation of innovation...

New drugs and medical devices extend lifespans, new tools and procedures make surgeries less of an ordeal, and new software brings record-keeping and billing from the era of manila folders into the digital age (or at least attempts to.)

And at every healthcare gathering, there are panel discussions about the next wave of big ideas that participants believe are just around the bend.

But there's a tension between the desire to innovate and the organization's need for quality, safety, efficiency, and regulatory compliance. Between innovators cultivating ideas that could improve healthcare along all of those dimensions, and the people who are incredibly busy tending to patients, hitting quarterly revenue goals, or otherwise "keeping the lights on."

As a result, many healthcare organizations haven't fully developed their ability to:

- Source ideas from their employees
- Source ideas from the healthcare industry outside their walls
- Filter those ideas to identify those with the highest potential to impact patient care or the business
- Run pilot tests with willing departments/teams
- Analyze the data from those pilot tests
- Scale what works throughout the organization.

This report collects case studies we've written about how for-profit and non-profit healthcare companies have been working to build those capabilities — including Medtronic, Johnson & Johnson, CVS, and Johns Hopkins. They cover everything from mobile apps to innovation labs to artificial intelligence.

We also fielded a short survey in Q1 2018 to gather data on three topics: the players most likely to disrupt

the healthcare industry in the coming decade; the biggest frustrations that consumers or patients experience; and the most common internal barriers to innovation in healthcare organizations.

On that last question, the top response won't surprise you: "Individuals' or departments' unwillingness to change." Innovation is never just about the idea or the business case: it's about relationships, diplomacy, aligned interests, incentives, and communication.

You'll find survey data on the next few pages, followed by a chart that we use to highlight some of the key questions to ask when you are working to improve the way you source, sift, pilot, and scale new ideas.

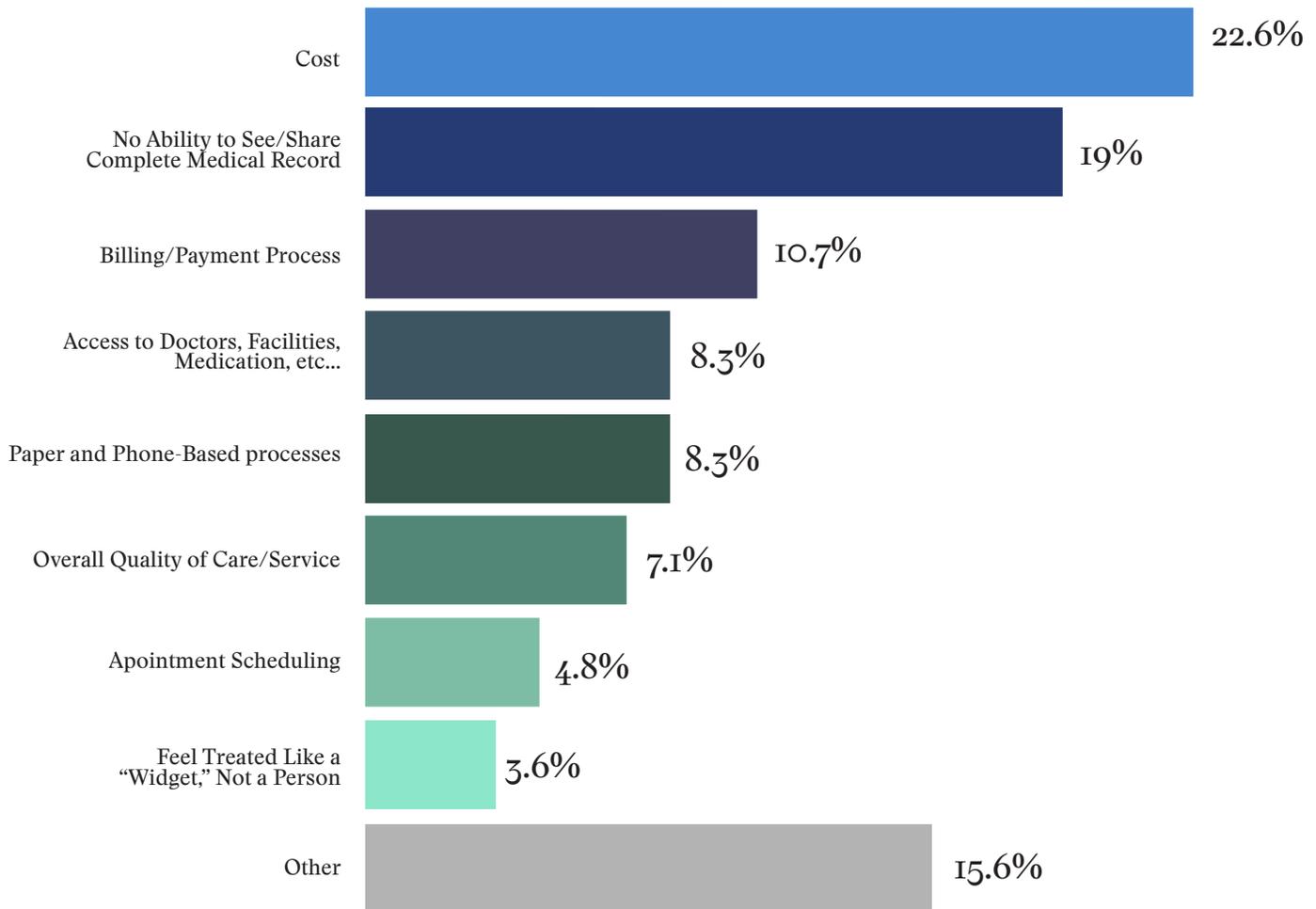
Healthcare organizations are an extremely challenging and complex environment for innovation. But the need for them to innovate has never been more intense—whether in response to new entrants, changing customer behaviors, cost pressures, or shifting reimbursement paradigms.

Can you devote more of your organization's resources and time to innovation? Move projects from pilot to roll-out faster? Involve constituencies that haven't been traditionally been considered innovators? Create new incentives and reduce bureaucratic hurdles? We hope this report will get you thinking about those questions—and provide some concrete examples of how other healthcare organizations have thought through them.

EDITOR'S NOTE

We're grateful to our partners at the Nason Group for their sponsorship of this research report. The report itself was produced by the editorial staff of Innovation Leader, and was not subject to sponsor guidance or review.

As a Patient or Consumer of Healthcare, What is Your Single Biggest Frustration?

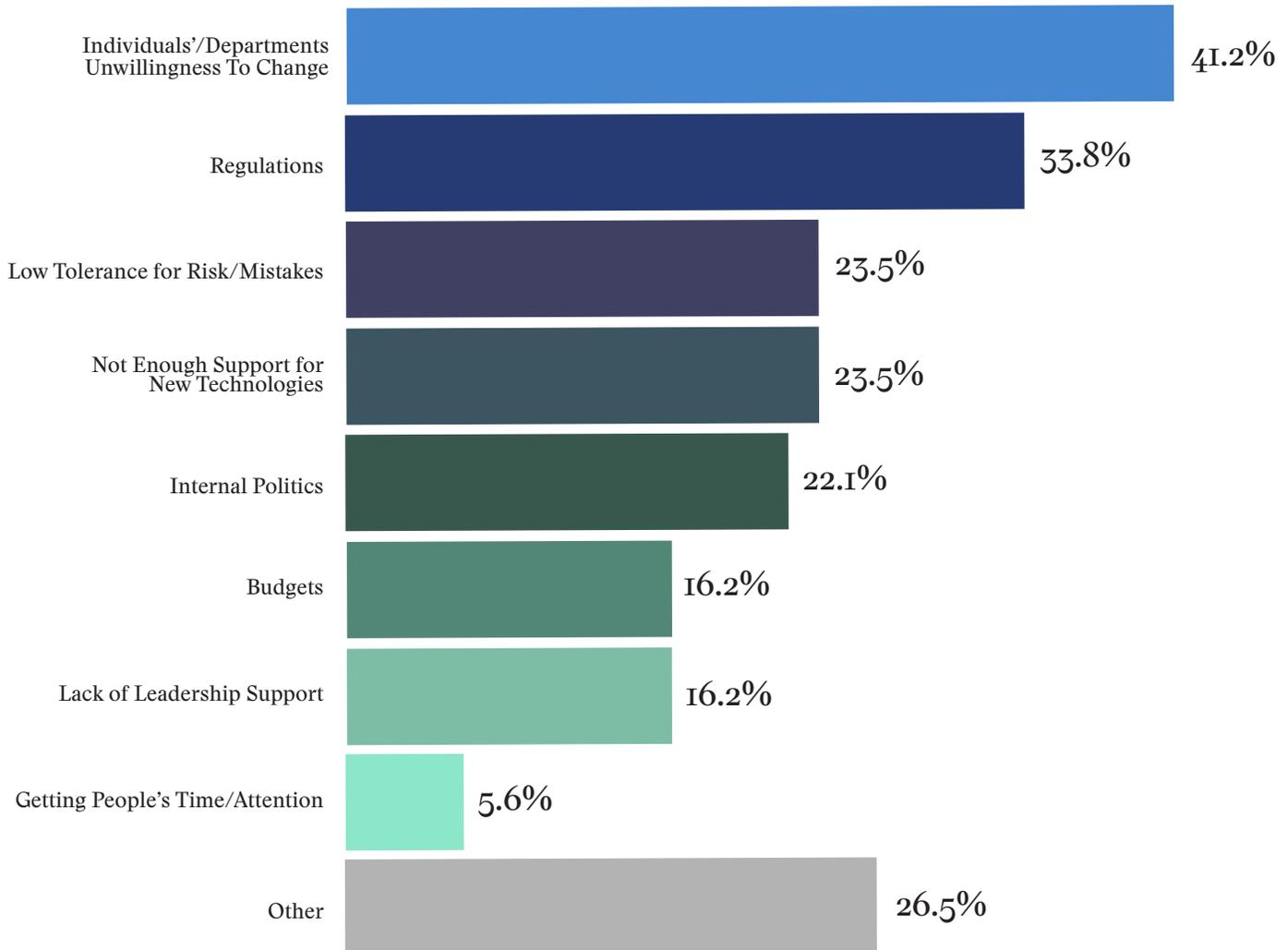


Some of the "Other" comments included:

- "All of the above."
- "Process is driven by the providers, unlike other industries and new companies, which take care of end user first."
- "Lack of information-sharing and transparency around price of services at time of service."
- "Government reach into highly personal needs."
- "Inability to translate healthcare records into a personal healthcare story I understand and that I can use to make better nutritional/self-care decision, before the need to see a doctor."

*Based on a survey with 84 respondents conducted by Innovation Leader in Q1 2018

What are the Biggest Barriers to Innovation in Healthcare?



Some of the "Other" comments included:

- "Lobbying"
- "Bureaucracy and silos"
- "Lack of cross-company collaboration"
- "Lack of customer experience design. Engage customers, don't treat patients."
- "Lack of data interoperability; having to build your own dataset from scratch."
- "Power/profit of incumbents"
- "Large organizational problem of not looking at things that may disrupt the industry tomorrow because they impact status quo now (a la Clay Christensen)."
- "Inability to correctly forecast the transition to value-based reimbursement"
- "Current way pays too well"
- "EMR and charting"

*Based on a survey with 84 respondents conducted by Innovation Leader in Q1 2018

What Player is Most Likely to Disrupt/ Impact Healthcare in the Next 10 Years?



The top six players mentioned by survey respondents were: (1) Amazon; (2) Medicare, congress, or other branches of the federal government; (3) Google; (4) Major national retailers like Walmart, Target, or CVS; (5) Apple; (6) An emerging startup or new software player we don't know yet.

*Based on a survey with 84 respondents conducted by Innovation Leader in Q1 2018

Key Questions for Healthcare Innovators

1. Sourcing & Sifting

What are the challenges/opportunity areas we should address?

How will we source ideas? From inside and/or outside of our organization?

What are the criteria for identifying those ideas with the highest potential for business/patient impact?

2. Pilots & Analysis

How and where can we set up low risk, low investment pilots?

What outcomes will indicate a “win” that should be scaled?

3. Scaling

Who needs to be
“bought in” for
scale-up to be
successful?

What works (or doesn't work) at the pilot or scale-up stage should provide useful feedback to your sourcing and sifting activity.

Pharmaceuticals

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Fostering a New Culture of Innovation: What Pfizer has Learned

BY KELSEY ALPAIO, ASSISTANT EDITOR



Dan Seewald, Senior Director of Worldwide Innovation at Pfizer

Almost a decade ago, Pfizer, the \$48 billion pharmaceutical company based in New York, set out to create an innovation framework. But at the time, each part of the business was embarking on its own separate innovation journey. That was better than not pursuing innovation at all, says Dan Seewald, Senior Director of Worldwide Innovation at Pfizer and Head of the Dare to Try Initiative. But it presented a challenge for the 100,000-person, global organization. “If you don’t have a common vernacular, if you don’t have a common culture, if you don’t have the same frame of reference...then you lose the scalability and the impact of having one program, one mindset, and one social movement,” says Seewald.

To tackle that challenge, Seewald and his team set out to create a unified innovation and experimentation framework. This framework, known as “Dare to Try,” is comprised of a variety of tools, behavioral expectations, a champion network, and training sessions, all dedicated to helping individuals and teams around the company create innovative solutions, and more importantly, instill an innovative mindset and culture within the organization as a whole.

We sat down with Seewald to learn more about the development of this framework; the development of the network of champions; how the organization measures the success of the Dare to Try initiative; and the importance of creating an “brand” that innovators connect to.

...

THE GOALS OF DARE TO TRY

Very broadly speaking, Dare to Try started as an innovation and experimentation corporate program, and the goal was to enable Pfizer colleagues to be able to think more like an entrepreneur, which is to think different, take thoughtful risks, and really be disciplined in how they experiment or test new ideas. The goals, when it launched a few years ago, were about giving people hands-on experience with the “Dare to Try” framework, tools, mindset, and techniques — to be able to generate real examples that [Dare to Try] has business impact. Long-term, [our goals were] around embedding a culture of innovation and experimentation across the organization.

We’ve evolved from a program to being a mindset, and even more importantly now, a social movement within the Pfizer organization...When you

Dare to Try is about encouraging an *entrepreneurial* mindset, where colleagues create bold, new ideas and develop them through thoughtful risk taking.



look at the most powerful grassroots movements in organizations, it's not just the top of the organization that is mandating "thou shalt be innovative and entrepreneurial." It's more that the people in the organization, wherever you look around the world, are asking for this. They want to be the change and they want to accelerate change in the everyday. From where [Dare to Try] started to where it is today, I believe that we are fulfilling that mission of being able to drive change and innovation...at Pfizer.

Everybody talks about innovation within the corporate setting: "We have to be more innovative, more nimble or agile." We realized that within our organization and within our industry, for a 100,000-person organization to be successful in the long-term, we need to be able to harness the mindset that allows us to be agile everyday. Healthcare, pharmaceuticals, and life sciences are changing really fast. If we don't...inculcate [an innovative] mindset and culture within our people, then we're not going to thrive in the long run. [Culture change] is not easy in a highly-regulated, traditional industry—in a very entrenched company that's been around for more than 150 years. So it means doing pretty drastic things to be able to drive home this innovation culture.

[Our innovation program is] something that happened over time...We built a brand around this, both in terms of naming the program, to iconography, style, and training. ...It didn't happen overnight. I think that if we'd started out with a centralized approach, it may not have worked in the long run. I think allowing there to be drift in the beginning allowed us to have more exposure across the different businesses, but then coming in and really driving one culture and one program—that ultimately was important.

I think eventually you have to come to a centralized approach, otherwise, you just have competing cultures within one organization, which in my opinion is not a great thing to have.

RECRUITING INNOVATION CHAMPIONS

[Our recruitment of innovation champions] started out as a nomination process, like a lot of companies do, and we gave a broad profile of what a good champion looks like. When we talk about what a good champion is, there's six attributes or characteristics. Not everyone has it in equal proportion... [A champion may be] innately a good ideator, they are good in front of a group, or a strong facilitator...

'Dare to Try' has so far trained about 500 innovation champions at Pfizer.

They're good in front of a room so they can train, inspire, and lead a group. They can shepherd or lead a project, they can drive momentum after a session, they can role model and also mentor teams and individuals. And last, but certainly not least, they can be an evangelist or an advocate within the organization. So maybe someone doesn't have enough time to facilitate or train, but they're really evangelical about the "gospel of innovation" and Dare to Try. We recognize not every person is going to be equally good in each of these areas, so you try to engage people based on what they're really good at.

Some people were nominated because it was convenient, or because they felt there was a decent chance they would be a good fit. Initially, our first round of champions were identified, many of them persisted in the network, but not everyone was perfectly cut out for it, and they may have gone inactive. [We learned that] nomination, when you leave it to the devices of other folks, you don't always get a perfect fit.

We've moved from there to more of a voluntary approach, and the volunteer approach is people nominating themselves, and other people, managers, approving it. I would say our retention rate went up a lot higher when it [became] volunteer. Now, we're trying to take it to the next level, which is using predictive analytics and a multi-level approach where the champions who are really strong and really passionate help us identify the future champions. We're going to be running some experiments over this year. In a 100,000-person organization, we believe that between 3 to 5 percent of people really are a good fit, which is 3,000 to 5,000 individuals in the organization.

But just because somebody may not be a great champion, that doesn't mean they may not be a great part of the Dare to Try network. Someone might be really good at organizing or participating in sessions. They might be a strong ideator, but just perhaps aren't cut out to be in the process of facilitating. So, we want everybody to have a strong baseline knowledge so everybody can be a part of the innovation experimentation program. I think of it as the democratization of innovation.

KEEPING CHAMPIONS AND INNOVATORS INVOLVED

[Keeping people involved in the champion network takes] a combination of intrinsic and extrinsic motivations. Specifically, when I think about intrinsic motivations, it's getting people who really are a good fit...recognition for what they're doing, giving them opportunities to be exposed to other parts of

the business, and [giving them the opportunity to] see really cool projects and challenges that they otherwise might not see in their day-to-day. It's also about their managers and their leaders knowing that they're making a difference and impacting the organization. There's the extrinsic factors as well. We're trying to give people additional upskilling opportunities. We're also trying to provide master classes and meetups—opportunities to build your skills not just as a champion, but also as a leader and as an innovator.

There's also other things that [we do] in terms of rewards. We're using game mechanics now, so that our champions can see how they compare to other champions, and their managers can see what they've done.

I would say last but not least...it's showing them that me and my team [are] also out there doing all these things ourselves. We're not telling them to do something we wouldn't do. We're right there in the trenches, running workshops and sessions. We walk the walk as much as we talk the talk, if not more. I think that's a really important factor in keeping people engaged.

There are roughly 500 champions, and the number grows every year. What causes it to go up or down is some people leave the company, and some people get promoted to much more senior positions, and they're managing bigger teams and they can't be active, so they become "inactive" champions. We have a couple hundred champions who are inactive, who are more senior in the organization,

“We’ve evolved from a program to being a mindset, and even more importantly now, a social movement within the Pfizer organization...When you look at the most powerful grassroots movements in organizations, it’s not just the top of the organization that is mandating ‘thou shalt be innovative and entrepreneurial.’ It’s more that the people in the organization, wherever you look around the world, are asking for this.”

DAN SEEWALD, SENIOR DIRECTOR OF WORLDWIDE INNOVATION AT PFIZER

or are doing other things where they can't commit to being in the active network of running sessions, training, events and so on...We recognize that your day job is what pays the bills. There are only a handful of people who are dedicated full-time to Dare to Try across the enterprise, and our volunteer corps use 5 to 10 percent of their time [for Dare to Try], and that's going to vary based on the person. We recognize that the leaders that they report to might

say, “This is cool that you’re doing this, but you have to do your job.”

UTILIZING ANALYTICS TO IMPROVE DARE TO TRY

As far as analytics for champions, we’re still figuring that out. [We do] look at our champion network and at the organization and we ask ourselves, “Based on where our champions are, and based on the business, where are there gaps geographically, business-wide, and organizationally?” We want to work with leaders to highlight where those gaps may be and encourage them to work with us to identify where there are opportunities for new champions.

We use a lot of other analytic approaches [to] understand and improve our trainings and workshops. We do a tremendous amount of surveying. We’ll run campaigns on creating awareness and socializing stories about Dare to Try. We look at everything from click rates, what they’re doing,

how long they’re on [the site.] An example is, we just ran a campaign called “A Little Help From Our Friends,” and this campaign was to highlight a story of where Dare to Try really had a huge business impact for Pfizer. In that campaign, we ran it in five markets in Europe first before going global. We had over 18 different test arms that we ran with different subjects, different visuals, different calls to action, and we analyzed all those trying to come up with the optimal design. Our initial hypotheses were debunked after we looked at the cold, hard metrics. That allowed us to design a better campaign.

We’re also really interested to understand the thinking styles of really strong champions. There’s a variety of different psychometrics out there—from Myers Briggs to DISC—and there are a couple specific to innovative thinking styles, like Four-Sight and the Herrmann Brain Assessment. We’ve asked ourselves, could you design better innovation teams...based on the type of assessment they take? So if you want to build a team to be able to solve a problem, and you’re in the early stage of problem

A list of champion roles that Pfizer employees can play.

Profiling
&
Attracting

Profile of the Champion Role



- **Facilitator:** Skillfully leads teams through the “process” of facilitating tools and behaviors, creates team camaraderie and a sense of purpose
- **Trainer:** Lead session and teach behaviors/tools “in front of room” for future champions and participants
- **Mentor:** Helps advise and guide other champions/colleagues with Dare to Try tools
- **Shepherd:** Guides teams through the innovation process and drives teams towards action & commitments
- **Ideator:** Challenges team’s conventions and brings provocative + associative thinking style to sessions
- **Evangelist:** Identifies and promotes opportunities to apply Dare to Try beyond the formal workshops (i.e. in the everyday)



definition and insight gathering, using those thinking styles could be a way to design your optimal team. We often know on gut who we think are the right people to mix, but having thinking styles would allow you to use more of a psychometric and analytic approach towards recruiting and designing teams for high performance...We have not yet really implemented it, but it's something that we're looking to experiment with.

MEASURING RESULTS

Activity doesn't necessarily get results, but it's a marker—a surrogate for results. From an activity standpoint, we are tracking the number of workshops that are conducted. We're looking at the number of champions in our network, and we look at feedback on those champions and their sessions. So we get a sense of if these sessions, workshops, and trainings are effective. Then the next question is, if you're getting activity, is it driving results?

Now you have to define what does it mean to have results? For me, there are two sides of it. There's the behavioral and the cultural piece, which is absolutely critical. For example...let's say you spark somebody at a session, who's not been trained even as a champion, but they've been to a session and they've been inspired. They're working on something in their spare time, and you create the forums, the inspiration, and the creative collisions for them to build something that's really amazing. Then, you see a year later, they say, "Hey I created this, I used a couple of the tools, I partnered with this person." It's hard to track that on a metrics basis, so you have to curate those stories—which means you have to listen and you have to ask.

The culture piece [is] so important and hard to measure. The answer for me is, you have to measure this over time and ask the right questions. We do an innovation climate survey every year. It is statistically representative across all of our businesses and all of our regions, and it allows us to see things like the physical environment motivating people to think and be more creative, and how leaders can enable and empower people to do creative things. We ask about 20-25 questions. It's based on a variety of work and research that's been done in the field of applied creativity and innovation. It allows us to drill down and see organizationally how we're doing and how our culture compares. We're finding consistently that we're doing really well from that cultural standpoint. The other half, besides culture, is business impact, both strategic and financial. A couple of years ago, we looked at all of the work-

shops that produced ideas and experiments. We went to the teams and we worked with our internal finance [group] to say, "Can we monetize any of the results? Was there business impact that drove the business in a measurable way?" We were able to monetize quite a few of them and show that if we had not run this session, and this team had not gone through this process...it wouldn't have produced this business impact. And some of that goes into direct measurement from their operating plans, so did they increase or grow their operating plan based on that work?

What I think is more important is being able to identify examples and stories that do have some monetization connected to them... We try to identify those stories within the organization...because stories will live longer than a dashboard will. For me, the thing that I look at is when somebody sends me a message or stops me in the hallway and says, "I'm thinking about Pfizer and what we do in a whole different way, I'm so excited to do this now." One inspired person can change the world, and the more people you can inspire consistently, the more difference you're going to make. It's just hard to show that as a metric.

GETTING EXECUTIVE BUY-IN

I really do believe that while the grassroots are important, it's also important that you have leadership engagement. If your leaders say "Yeah, that's nice, but we have other things to do," and they actively discourage participation, then you're never going to get traction. It's always going to be a skunkworks operation. We're really lucky because our CEO really gets and endorses Dare to Try, and also how important culture is to us as an organization.

He's really been a big proponent of Dare to Try and this broader movement across Pfizer called "OWNIT!"

OWNIT! is this idea that you're responsible, that you're accountable, and that you have to own it. You have to own your own innovation, you have to own your own culture within your team in the organization. He drives that and talks about it on a very consistent basis, externally and internally. But if it was only him, they would just say, "It's the CEO, it's just lip-service." But the truth of the matter is, his entire executive leadership team has bought in.

We had [the executive leadership] at an off-site working on an initiative, and they all went along with doing some of these innovation or Dare to Try-related activities, and they were fully bought in. They participated, they lived it, and they also actively encouraged the people in their organization to

Cultivating an Innovation Network



do it...When you get that type of leadership support, it helps galvanize the grassroots.

I think the other question is, as you have new leaders come in, and other people want to put their own imprint [on things], how do you make sure they stay aligned with Dare to Try? I think that it's our responsibility to give them the context, to educate them, to make it known what's available to them. They don't need to recreate the wheel and say, "Hey, we need to create our own innovation approach."

If I had to make a recommendation to somebody leading a new program or trying to create a program, I would say that you have to get the senior sponsorship...You've got to move up the chain to get that buy-in, and it's not always that easy. There might be a lot of selling, because you've got make it real for them so they can see it.

BRANDING YOUR INNOVATION INITIATIVE

One day...I said to myself, "Are we leading Dare to

Try as a program, or are we treating it more like a brand?" I've talked about it being a social movement, but it also is a brand. ... If people just see it as something to do, it's a program. Programs come and go. But if you treat it like a brand, it's got a brand identity, you have iconography, and you have characters people can identify with. Think about the Geico gecko. People associate with it. People identify with brands.

If you can get people to identify with your program as a brand that they're a part of, that they can own a slice of—then you've done your job. So you have to be a marketer as much as you are a change agent, an innovator, a facilitator, and a trainer. You have to build brand equity, and it's not easy to do. It takes time, and you have to earn it. I ask myself all the time, "What's our brand promise? What's our positioning? Who are our segments? What do we want to be?" I don't hear a lot of people talk about innovation in their organization as a brand, and I think they should. ♦

A graph shows how maintaining a network of champions requires continual work.

Open Innovation at \$25 Billion AstraZeneca: What We've Learned So Far

BY SCOTT KIRSNER, EDITOR



Scott Wilkins,
Enterprise Innovation
Director at AstraZeneca

As part of our Innovation Leader Live series of conference calls, we spoke with Scott Wilkins, Enterprise Innovation Director at the British pharmaceutical firm AstraZeneca and his colleague Rob Albert, the Collaboration Delivery and Exploitation Lead. While AstraZeneca is headquartered in London, Wilkins and Albert work in the company's Waltham, Mass. research and development site.

They discussed the history of open innovation at AstraZeneca; how they use recognition and financial rewards for people who help them with challenges; how they got legal and compliance leaders on their side; and how they're shifting the culture at AstraZeneca from feeling like every great breakthrough needs to come from an employee. In Wilkins' words, the company now stresses that "the patient doesn't care who solves the problem"—just that there is a new drug available to treat their disease.

...

HOW OPEN INNOVATION GOT STARTED AT ASTRAZENECA

It really started back in 2010. We were looking to build our pipeline up, to replenish the [products on the market] that were coming off patents.

There was a gap there, and we needed a step change in the way we did R&D. New leadership was brought in, and one of the top things that I heard from the leaders was that we're not working together enough in R&D. The therapeutic areas aren't working together, and there are too many silos. We have 10,000 people in R&D, a large R&D budget. How can we do things differently?

One of the things that I saw was around crowdsourcing. You [could] get someone in the cardiovascular therapeutic area that's a chemist, and someone in oncology, and they can help each other with their problems and their challenges. The issues are that they're in different therapeutic areas, so they're not necessarily in the same circle. They might be spread out geographically, too. One could be in Sweden, the other could be in the U.K. or the U.S. How do we get these people together? We piloted some tools and we decided to go with one called iSolve. That was our internally-branded internal collaboration tool [built in partnership with InnoCentive, a crowdsourcing platform.] That was around connecting the 10,000 people that we had globally.

Oncology was interested in getting some of their problems out to the different therapeutic areas.

When we did the pilot with oncology, and so it was really oncology problems that we put out there. ... We would send them out to pretty much everyone in R&D. We probably had 8,000 people out of the 10,000 people that were connected to the iSolve platform. Oncology problems were the first ones.

We started with internal innovation and then we thought, “How do we do open innovation [externally]?” We build up confidence, ran a bunch of events, solved some significant R&D problems internally, and then I think that really set the stage for us to [create] an open innovation business case that was supported by the R&D leadership team.

That launched in 2014, and has been going well. The team actually won a CEO award. It’s a company of 60,000 people, and there’s a handful of these awards to go out each year, and the open innovation team was one of them.

SOURCING PROBLEMS TO WORK ON

We had support of the R&D leadership team, and so we had representatives for each of the [therapeutic] areas, and they would go out [and] would look for challenge owners.

[Challenge owners] are people with problems that would raise their hand and say, “I need some help,” and they would post it out. The reward for them is, they get their problem solved. They would be able to make a decision from there, to either advance [a project or] to stop a project, because you have new information that the project’s probably not going to make it into a drug, or make it to the next phase.

We launched iSolve, and the internal platform in 2012. It was in 2014 that we launched the open innovation site. It was in development for about a year... We wanted to be careful, and do it the right way. It’s getting the right problems out there, the ones that we can’t solve internally. The other thing is around IP transfer and legal implications [and] compliance.

There’s just a lot of groups we had to work with, and I guess my advice is involve these folks early, and really try to partner with them, and have a balanced, risk-versus-reward discussion. I think that helped us move the conversation forward, rather than just focusing on risk, around the risk of potentially IP issues. You can have that conversation, but also balance that with the benefits. The benefits are that we’ve got 10,000 scientists, and we’ve got hundreds of companies, and academic institutions, and government institutions that we partner with. But there’s several billion people in the world, and those answers to our problems could be beyond our current scope right now, with the partners that we have and the folks in our R&D facility.

GETTING THE RIGHT PEOPLE BEHIND IT

We had examples of where other companies were doing [open innovation externally.] I think the key here was that we had the top scientific leadership on board with this, including the heads of R&D. In our process, it’s the person in charge of a therapeutic area that reports into either the head of research, or the head of development. They’re the ones who sign off on any challenge that goes outside.

The next thing, after we got scientific leadership and senior scientists on board, was getting legal on board. Scientists know a lot about the IP, and they know what risks are there, so it was about explaining to legal that, “OK, we have the head of the therapeutic area, and the senior scientists who are comfortable with putting this problem out there.”

It’s having that discussion, then if something came up with compliance, we would have our colleagues in legal talk to the people in compliance on why this should go forward, and what the benefits are to the company. It’s kind of getting your ducks in a row, so to speak, which is helpful for us.

Rob Albert: Really, the only other guys who were opening the door at that time [was Eli] Lilly. If you look back, actually, the founder of InnoCentive came from Lilly, and he’s back at Lilly now. But we, Astra-Zeneca and Lilly, are really the pioneers in opening up this kind of innovation, and open collaboration.

“There’s just a lot of groups we had to work with, and I guess my advice is involve these folks early, and really try to partner with them, and have a balanced, risk-versus-reward discussion.”

SCOTT WILKINS, ENTERPRISE INNOVATION DIRECTOR AT ASTRAZENECA

SUCCESS STORIES

One of the examples that Scott and I generally like to share is that we were asked a question from the manufacturing group in the U.K. They were trying to manufacture a clinical [drug] candidate, and they needed some help. They weren’t getting any traction through the normal means, so we posted the challenge on iSolve, and one of the scientists from our Waltham [Massachusetts] area actually logged on and said, “I actually did this kind of work as a grad student. This is what you need to do. You can take out these two steps, you can eliminate this expensive catalyst. By the way, you’re going to cut down on multiple gallons of severely toxic waste.” That had the potential to save millions of dollars. It was a huge success. He was actually recognized at the end of the year,

at dinner, from what we call iMed, which is our innovative medicines group. That kind of success breeds success. [Another] of the things that I like to talk about is the clinical compounding. ...We have compounds [that] went [into clinical trials], and failed for one reason or another. Now, it could be failed for efficacy for their intended target, it could be they failed for safety margins.

What we've decided to do, which is a complete about-face for pharma, is instead of just allowing those compounds to sit on a shelf and serve no purpose, we said [to outside parties], "Come take our compounds, repurpose them, and tell us what you want to use them for." Out of that are going to be delivered two new medical entities for cancer treatment, which is awesome, because that's two compounds that were literally put on the shelf, and now they're going to be delivered to change people's lives. It's really, really cool stuff.

Some people suggest that open innovation and crowdsourcing tools are really only useful for incremental problems and solutions, and not for breakthrough or disruptive ideas. One of the paradigms that we're trying to challenge is the view that this can only be helpful in certain situations. My own take on that is, that can be true if you don't have an overarching program with an overarching goal. We're not just paying lip service to open innovation. We're actively promoting our open innovation. We are partnering with people like the Medical Research Council in Cambridge in England, and we're partnering with tons and tons of [other] academic institutions. We're partnering with other pharma and other biopharma [companies], so there's a lot of collaboration that's coming directly out of this open innovation platform.

I'm sure that you are all facing budget constraints, and budget cuts, and travel restrictions, and [the need to] do more with less. Open innovation is one way to do more with less. This is one way to take advantage of expertise and best practices sharing that we all have in our own companies.

BEST INCENTIVES

With internal innovation, we tried [financial rewards] in the beginning. It just was that the recognition, when [we followed] up with the challenge winners, they said that the recognition was more important. If you look at a TED Talk, Dan Pink has a nice video on [how] at the poverty level, money is an incentive, but when people are getting paid, it's not going to do much. We have year-end iMed, or integrated medicine, awards. We have year-end CEO awards, we have year-end CIO awards. What

we did this past year is, we were encouraged to submit a video explaining why you deserve to be considered for the CEO award. I'll use the innovation team. Out of a hundred main entrants, we were in the top three. That, to me, was really awesome. We got a plaque, and we had dinner, and we got recognized at the CEO awards, which was broadcast via webcast.

Our video was shown. It was a 90-second video, and it talked about the cool things that we do. We saw an uptick in that, and interest in our website, and people coming to us. Like anything, recognition and communication go hand-in-hand, and at the end of the day, we're a company of scientists... We like to solve problems, for solving problems' sake. We're not motivated by money. We're motivated by recognition by peers.

With external challenges, what InnoCentive [our partner for those challenges] has seen is that if you post a challenge, and you don't post an award that's appropriate for the type of challenge...you're going to get garbage responses. ... We are going to reward you for well thought-out answers to our challenges. That makes a big difference to external parties, because the top solver at InnoCentive pretty much does this as his full-time job. He solves lots of challenges on the InnoCentive website, because he's just a brilliant thinker.

POTENTIAL PITFALLS

You have to get legal and compliance to be your friends, first. You have to make them understand why you're doing [open innovation], you have to show the clear cost benefit, and then I would take that one step further. You have to show the reason why, if you don't do this, what the drawback is going to be. I would seriously consider why not doing it will be a failure. For the pharma industry, not doing it would lead to your competitors doing it, and having an edge over you. That's just an oversimplification, but that's one argument in favor of doing it.

People may have looked at putting a problem out there as a weakness, right? If I put my problem out there, [my competitors are] going to know that I don't have the answer. What we talk about [now is that] the patient doesn't care who solves the problem. The business and the shareholders don't care who solves the problem, so you're not responsible for solving the problem. You're accountable for solving the problem. I've seen a lot of lights go off with scientists when they say that, and it's almost like they're able to let go of any fear that they had once they get that. ♦

Examining Ties Between Business Units and J&J's Innovation Centers

BY AMY LUCAS, CONTRIBUTING WRITER



JLABS at
LabCentral in
Cambridge, Mass.

How do innovation teams build constructive working relationships with the business units? That was the focus of one of our 2017 research reports. And among the people we sought out for advice was Darren Snellgrove, Chief Financial Officer for Johnson & Johnson's network of innovation centers. The centers aim to be an interface between J&J's various business units—including pharmaceuticals, medical devices, and consumer healthcare—and the world of startups and academic research institutions. The goal is to spark new collaborations, and sometimes investments, that will lead to new products that J&J can deliver to patients.

...

WHAT WE DO

J&J has three sectors: pharmaceutical, medical device, and consumer, and the innovation centers are one of the few places where those three sectors come together. At J&J Innovation, we've invested in some exciting areas across all three sectors and we're seeing a lot more convergence. General areas of investment include; immuno-oncology, robotic surgery, 3D-printing, gene therapy, the microbiome, wearable technologies, and light therapy for aging and acne. The consumerization of healthcare and the wearable space will have a big impact on healthcare. Wearables, for example, can provide diagnostic capability, continuous monitoring, caregiver interaction, and increased patient and physician interaction.

HOW BUSINESS-SIDE EMPLOYEES GET INVOLVED WITH US

The model is one where we actually put the scientific and technical experts from J&J strategic areas of interest in the innovation centers. So it's somewhat unique. We've done that to make sure that there's absolute connectivity back to our R&D organization, which works side-by-side with our commercial and business unit partners. We've found this to be a pretty effective model, because it reduces the risk of doing off-strategy investments, and it speeds up the deal process because we are in direct communication. That's something that's really important for us, particularly when you're working with smaller companies and entrepreneurs where every second counts, and they don't have time to wait six months for a large corporation to make a decision. We have

one innovation center located in Silicon Valley, California; another one in Cambridge, Massachusetts; one in London, which is our hub for Europe; and then another in Shanghai.

HOW WE COLLABORATE WITH STARTUPS AND ACADEMIA

A lot of the easy challenges in healthcare have been solved already, and we know that our scientists can't be heads down in a lab and come up with a cure for Alzheimer's on their own. They've got to be working with the best and the brightest entrepreneurs, academics, small companies, and so we put a lot of focus on collaboration.

In the past, I think J&J has done more mid- to late-stage licensing deals and acquisitions [of smaller companies,] and there's less of those available [in our industry.] ...Deal prices have increased, and so it's become harder to create value through those late-stage collaborations. We recognized that we needed to focus earlier, and we do this through a number of mechanisms.

We have JLABS, our incubator model. Companies can literally start with a credit card and get just the right amount of lab space that they need. They can share equipment with other companies, and it's a great way for them to get their healthcare company off the ground without investing a huge amount of capital on labs and equipment. It allows us to build a relationship with various companies such that when it comes time to do a strategic collaboration, they hopefully come to J&J first, because we've helped them and built a good relationship.

We also invest in the ecosystems that we're in, whether it be through early-stage investments in companies, providing advice and expertise, research grants, and various other mechanisms that we use to build partnerships and relationships at the early stages.

BOTH SIDES HAVE SKIN IN THE GAME

We have the business units providing at least 50 percent of our deal funding [when we make investments in startups.] Co-funding is a critical component of our model, and on every collaboration we provide 50 percent of the deal funding from J&J Innovation, and the business unit provides the other 50 percent.

We have found that both sides having skin in the game, and a say in the decision making is an important component of success. We've actually looked at this model in terms of the returns that we get, and we've found that deals perform better when there's this kind of 50-50 collaboration approach.

OUR TRAINING AND EDUCATION ROLE

We provide training and education, mostly around new, disruptive technologies that we're seeing, as well as a lot of education around the types of deal structures and approaches that we're deploying. We try and take an agnostic approach to the deal structure and find what works best for the partner and for J&J, often deploying structures that our business units are not used to seeing. In turn, our business units educate us on the latest thinking on the business strategy, so that we can help them achieve their objectives.

“A lot of the easy challenges in healthcare have been solved already, and we know that our scientists can't be heads down in a lab and come up with a cure for Alzheimer's on their own. They've got to be working with the best and the brightest entrepreneurs, academics, small companies.”

DARREN SNELGROVE, CFO, J&J INNOVATION CENTERS

From my perspective, it's an extremely important relationship, and I think it's one that's evolving within J&J Innovation. We're primarily focused on product innovation, but there's a lot that we can and should do really in conjunction with the business units to help with business model innovation.

A SUCCESSFUL COLLABORATION WITH GOOGLE

One that's interesting has been a deal that we did in our medical device group in collaboration with Verily, which is Google's healthcare group. We formed a new company called Verb, which is focused on robotic surgery. It's a really exciting deal, and a great example of collaborating with a business unit to really think about the commercial strategy and how a robotic platform could play into our surgical franchise, which is a big piece of J&J's medical device business.

PULLING TOGETHER DISPARATE GROUPS

About three-and-a-half years ago, we...recognized that it wasn't that easy to do business with J&J. We're a huge company that has a lot of capabilities to offer entrepreneurs and smaller companies, but it wasn't always easy to figure out how to access those capabilities. We had a lot of externally-facing organizations, which made it even more confusing. We wanted to simplify that and bring some of our



JLabs at the Texas Medical Center in Houston.

externally-facing groups together under the J&J Innovation umbrella.

Johnson & Johnson Development Corp. [JJDC], our venture investing group, is one of those groups. It's actually been around for more than 40 years, investing in various healthcare startups. It has been quite successful and has built a great reputation. We wanted to supplement that with JLABS (our incubator model) and also the innovation centers, which really are the glue that pull all the pieces of the model together. The innovation centers have scientific and operational experts from each of our therapeutic areas and business areas surrounded by finance, legal, and business development folks that can help execute on important collaborations. The JJDC investors are co-located in our innovation centers.

TRANSFORMATIONAL INNOVATION —BUT NOT AT ANY PRICE

We are focused on transformational innovation, and so we look at factors such as the level of unmet need, the amount of differentiation, the size of the opportunity, the strategic fit with Johnson & Johnson, the technical feasibility, and then [intellectual property] protection. We're really looking for opportunities where we have line-of-sight to the project becoming

an asset that can be on-boarded into the J&J pipeline, with the goal of bringing treatments to patients. We obviously use financial models as well to assess projects.

We defined success as reaching proof of concept and onboarding assets at a steady run rate into the J&J pipeline. The projects have to be transformational, and we can't do deals at any price. We've actually developed a framework called the "value creation pathway," which we use to make sure that our deal structures are appropriate from a value creation perspective.

GOVERNANCE, FUNDING, THE TRANSITION

We recognize that J&J is a big company and can be overwhelming at times, particularly for smaller companies, and we try to be really respectful and thoughtful about that so that we don't overwhelm them, and we bring the best that we have to offer to help them be successful. And if they're successful, we'll be successful as well. So that's one thing I would offer up.

Another would be to think carefully about your governance process, and funding mechanism, as well as your approach to the transition from your innovation group to your mainstream business unit. These are areas that are critical to success. ♦

How Bayer is Cultivating an Ecosystem of Consumer Health Startups

BY PAMELA BUMP, EDITORIAL ASSISTANT & RESEARCHER



Bayer Headquarters

More than a century after it formulated, patented, and branded Aspirin, \$51 billion Bayer AG is still best-known for that stalwart of the household medicine cabinet. But Bayer, headquartered in Leverkusen, Germany, owns a range of other healthcare-related brands, including Dr. Scholls, Alka Seltzer, Claritin, and Coppertone. And the 150-year old business is now in the midst of acquiring Monsanto, the St. Louis-based agriculture corporation which owns widely-used farming products like Roundup pest repellents, Fontanelle Hybrids, and Kruger Seeds.

On a smaller scale, Bayer is investing in new ecosystem engagement initiatives, like its G4A programs, to discover potential partnerships with players outside its walls.

In 2013, Bayer began to roll out its global G4A program in Berlin—under its original name “Grants4Apps”—with a focus on finding startups that could help them innovate in emerging or niche markets that were otherwise tough for big corporations to access. The G4A Generator launched in the U.S. in January of 2018. Along with two other Berlin-based programs, Accelerator and Dealmaker, the plan is to allow new and more mature startups around the world to pitch solutions to Bayer in hopes of an acquisition, pilot, licensing deal, or other collaboration opportunities.

Priscilla Beal, who heads digital health innovation for Bayer and the U.S. G4A initiatives, said her team felt it was the right time to bring the Berlin program to the United States.

“Bayer as an organization has been absolutely kicking ass at innovating on the molecule for the last 150 years. Now with the digital revolution, we’ve finally gotten to a place where, as an organization, we’re embracing the digital future,” says Beal.

STEPPING UP ECOSYSTEM ENGAGEMENT WITH SUBGROUPS

G4A is one of three subgroups within Beal’s Digital Health Innovation Team, which is tasked with creating new digital products and partnerships related to self-care. The other two groups are an Intelligence team and a Ventures team.

“Intelligence does scouting and strategic partnerships with five of the core innovation hubs around the world: Silicon Valley, Tel Aviv, Singapore, Shanghai, and Berlin. [Those cities are also]

where our five physical locations are. They're looking at ramping up partnerships specific to those ecosystems," Beal explains.

Intelligence also focuses on strategic and academic partnerships. For example, in Pittsburgh, "They're doing everything from partnering with organizations like the Pittsburgh Computing Center and local academic institutions like Carnegie Mellon University," says Beal. "They're trying to build reciprocal relationships with local ecosystems and organizations that have a shared vision."

The Ventures team is not focused on making venture investments, but rather forming companies. They're charged with "spinning out a product—and a company around that product." Beal adds, "Once it becomes viable, it either gets absorbed back into the company into the relevant division, or it gets spun out entirely on its own to Bayer's [global ventures group] LEAPS."

THE G4A INITIATIVE

Through G4A's original Berlin program, "Grants4Apps," Bayer was promoting challenges focused on mobile application solutions, which were "the big thing" at the time, according to Beal. It has since expanded in scope. The startups are given 50,000 euros, 100 days in a Bayer coworking space, and mentoring from Bayer employees in order to build a product.

This program has housed startups including xbird, an artificial intelligence program that uses smartphone sensors and other movement technology to predict the signs of illnesses, such as complications related to diabetes. Another example of a Grants 4 Apps participant is ThinkSono, which is developing diagnostic ultrasound technology that can diagnose Deep Vein Thrombosis, a potentially fatal condition causing blood clots to rise from the leg to the lung. Rather than forcing patients to schedule expensive and time-consuming radiology appointments to diagnose DVT, the app and technology turns portable ultrasound devices into diagnostic tools that can quickly spot clots.

The second program, Dealmaker, is for mature startups with close-to-market products. Startups similarly apply by submitting solutions to challenges posted on Bayer's G4A site.

Beal explains that Dealmaker is "more of a matchmaking program where we issue more complicated challenges from [Bayer's pharmaceutical division] and R&D. ... We spend a very intense bootcamp day where each startup and each challenger sit in a room and hash out a letter of intent and begin to talk about a scope of work for

a product, acquisition, or whatever the startup's solution to a challenge is," Beal explains.

In 2017, "[Dealmaker] had over 70 applications, and we closed 11 partnerships by the end of the year."

G4A ENTERS THE US

The US-based "G4A Generator" program Beal oversees is modeled after Dealmaker. The emphasis is on companies that have more mature products that are close to being marketable.

In its first year, the G4A program has decided to focus on the challenges of consumer health, rather than pharmaceuticals. Challenges for the competition were designed created by members of the Strategic Initiatives group within Bayer's consumer health division.

"Since the first cohort [in Berlin], we've really moved away from 'One app to rule the world' to 'How our applications can be applied to the challenges that we have,'" Beal says.

The program, which closed applications for its first cohort in March, is also managed predominantly online. It features just one in-person pitch competition at the end.

BUILDING SUPPORT

Beal notes that in most global companies, there are always challenges related to gaining support for something new—especially something designed to move fast.

"We feel very strongly that it's the team, more often than not, that makes the startup. We've crafted our program in a way that not only lets us capture very candidly the value that a possible partnership might bring, but it all still lets the personality of the startup shine through."

PRISCILLA BEAL, HEAD OF US G4A GENERATOR, BAYER

"When you're working in a large organization and you're coming at them with this startup spirit that the G4A team has generally, there's a speed that takes some getting used to for others," she says. "I would say that's the challenge, but that's also where the fun is."

"The process of getting stakeholders involved in the launch of a new program is long. We spoke with dozens of contacts in consumer health before we found the best fit," Beal says.

Skepticism centered around costs, and questions like, "Will it really result in innovation at the

P&L level?” according to Beal.

To prove the “entrepreneurial need” for the G4A initiative in the US, Beal’s team devoted time to internal messaging to promote and build support for its launch. While the digital health team is based in Pittsburgh, they sought help at other US locations from Bayer’s already-implemented Street Teams.

Street Teams, overseen by site leads at the six primary Bayer locations in the U.S., are made up of 10 to 20 enthusiastic Bayer employees. The teams are tasked with learning about and spreading the word on innovation initiatives within the company. Street Teams hold events about programs like G4A throughout the major Bayer cities.

“We had [a Street Team-hosted event] a few weeks ago in New York where we had a panel of speakers talk the self-care industry, and we gave an introduction to the G4A Generator specifically,” Beal says.

“We had the soft launch announcement of the program at Health 2.0 in October 2017. In January, when we launched the program, we worked with these challenge owners [who were] coming up with and digging down into what these challenge areas were, and what they wanted to accomplish. Once that was done, we had an onslaught of internal social media with e-newsletters, mailings, digital signage and videos to engage people with the Consumer Health Division itself.

With approval from members of Bayer’s consumer health division, including its head, Natalie Bartner, Beal’s team began to do similar external messaging and social media campaigns to let the outside world know about the competition.

LET THE COMPETITION BEGIN

Beal has made sure to align her work with the larger vision and mission at the company. “What we’ve done is we’ve framed [the program] all around the strategic vision and mission of consumer health, which is “To empower patients and their ability to deliver self-care to help their lives,” she says.

On its website, the Generator allows startups to apply for challenges in three specific areas of self-care: Nutritional Support, External Pain Management, and Skin and Sun Protection. It also features a fourth challenge catering to the whitespace, titled Digital Self-Care Solutions. The Generator also has a video submission area. This gives Beal’s team a better sense of the people involved with each startup.

“We feel very strongly that it’s the team, more often than not, that makes the startup,” Beal says.

“So we’ve crafted our program in a way that not only lets us capture very candidly the value that a possible partnership might bring, but it all still lets the personality of the startup shine through.”

Along with the video submission, the application asks entrants to briefly state the startup’s value proposition, as well as explain the market and revenue opportunities,

Four finalists from each category will pitch their product to panelists which include Bayer employees, VCs, and related industry experts at a New York City Kickoff event May 24. Following the pitches, one winner for each category will be announced.

Winners will be given a cash prize to help them move forward with their project. In early July, they’ll have a negotiation meeting and work to craft a letter of intent describing how their partnership with Bayer will continue. By the end of the month, partnerships will be announced and the startup will be handed off to Bayer’s consumer health division.

“Once they’re in, they’re actually in. ... They’re not put into an incubator where they either co-create, partner, or develop on their own. They become a partner with whomever their challenge owner is to decide how they want to move that product forward. They’ll be working and partnering with teams within consumer health,” Beal expands.

PLANS FOR THE FUTURE

As the applications for this first cohort of the G4A Generator are coming to a close, Beal explains that Bayer open to making some of the changes that new kinds of startup relationships may require.

“While we’re looking for mature startups and products close to [being] on-market, we also understand that [a partnership] might require both the startup and Bayer to change. Either in process, or in approach. We really have very open-ended requirements or thresholds. We’re intentionally inviting people looking for outright acquisition to investments or otherwise—whether it’s a [formal] partnership or a ‘Let’s see how it works’ project as a first go. We’re really kind of opening it up to the gamut, in [the] hopes that it spreads that aperture of the types of innovations that come our way.”

Even though the G4A Generator is still in its pilot year, Beal adds that she already has plans to expand with future challenges.

“We’ve launched this with very US-specific challenges for 2017, with the idea that next year we’ll expand to a globally-specific program,” Beal says. ♦

Process Kills Innovation: Merck Exec's Advice on Fostering Innovation in a Global Business

BY PATRICIA RIEDMAN YEAGER, CONTRIBUTING WRITER



Wim Vandenhouweele,
Commercial Innovation
Leader, Merck

We recently fielded an inquiry from an Innovation Leader member who wanted to learn more about building regional innovation initiatives that involve everyone from executives to lower-level employees. For answers, we turned to Merck's Wim Vandenhouweele, who runs commercial innovation for the \$39.5 billion pharmaceutical giant in Emerging Markets, Europe, and Canada. Vandenhouweele, who has worked for Merck in Belgium, the Netherlands, China, and the U.S., now works directly with different regions to drive commercial innovation and foster an innovation mindset globally.

DISTRIBUTED AND FOCUSED

Vandenhouweele's approach to global innovation is similar to those that Innovation Leader has encountered at companies such as Vodafone and others. Specifically, he brought a distributed philosophy to the challenge. "I don't want to build a team," he says. "I believe that process kills innovation."

Instead, Vandenhouweele identified in every region a "country innovation leader." In each case, that leader had another position at the company; for example, a marketing, medical, or other role. Between 40 and 50 employees across the world are chosen by this country leader to be responsible for commercial innovation.

Vandenhouweele is in regular contact with them to provide guidance and advice; he is currently tracking a portfolio for each region that has approximately 10 to 12 initiatives in each.

According to Vandenhouweele, this distributed approach has helped country leaders "zero in" on innovations that address a commercial problem or a customer problem. This is very different from the company's classic R&D function, which is to develop "new products or new medicines," he says.

According to Vandenhouweele, the process of identifying and pursuing those innovations comes down to three Ps:

1. **Problem:** Start with the problem, rather than a solution;
2. **Passion:** Identify and support the people who are passionate about their innovation project;
3. **Process:** Avoid it.

PROBLEM

This sounds obvious, but Vandenhouweele emphasizes that it is absolutely critical to start with a real problem identified on the ground locally.

Too often, says Vandenhouweele, companies take a solution-first approach directed from a centralized innovation lab or corporate headquarters. Those solutions, developed far from target countries and customers, are rarely successful due to implementation challenges in developing nations. “Large companies come up with a great idea, and say, ‘This is really great...what we need to do is to find someone somewhere who can implement it.’” And while sometimes there will be good synergy between HQ and the in-country team, Vandenhouweele says this approach rarely works. “It’s very, very challenging.”

To illustrate this dynamic, Vandenhouweele discussed Merck’s approach to drug adherence, or making sure patients take their full regimen of medication. This perennial healthcare issue could be addressed from HQ with a smart pillbox or reminder app, but those solutions would miss the mark. That’s because, according to Vandenhouweele, the on-the-ground adherence problem in certain nations may be different than the adherence challenge envisioned within the headquarters market. Smart pillboxes and reminder apps are good for those who forget to take their meds, says Vandenhouweele. But in emerging markets, patients might stop taking medicine for other reasons, like a fear of potential side effects. “A simple phone call could address that better than a smart pill box,” he says.

This disconnect between “top down” centralized innovation, and “bottom up” innovation from global teams in-country, is critical for companies to understand and solve. “Corporate HQ may come to the conclusion that adherence is the problem,” says Vandenhouweele, “but the reasons for non-adherence may differ widely in emerging nations.”

To approach the adherence problem from the “bottom up,” the team worked directly with teams in Australia, India, and the Philippines to address the adherence challenge at the regional level. The teams sought to understand the market dynamics in each country — including patients, hospitals, doctors, pharmacists, and more — and ultimately discovered that leveraging drugstore chains was the fastest and most efficient way to engage patients.

The final adherence program — which has been tested in multiple markets and is now being

rolled out to 15 countries—has multiple components, including call centers and technology, such as reminder apps. “We got those learnings over time,” says Vandenhouweele. “Once they reached that proof-of-concept, then I took the team that developed that solution, and asked them to share the results with the senior management team.”

Vandenhouweele was able to analyze key success criteria and identify all the countries and products that would benefit from the program. That included taking into account country-by-country compliance needs and implementation challenges. “Then we made a recommendation: ‘This is what we should be scaling to in these countries; here are the resources we would need; here are the resources the country would need; and we need this center of excellence to help countries,’” he says.

According to Vandenhouweele, the program is a perfect example of how on-the-ground “bottom up” approaches to innovation in countries can have a big impact. “It has dramatically increased adherence to many of the diseases Merck medicines address, especially diabetes.”

In the beginning, Vandenhouweele says he selected regional innovation leaders whose more senior status and credibility within Merck might help get innovations implemented. That was a total failure, he says. Later, he began seeking out specialists with particular knowledge, even if they were more junior in the organization.

Of course there are no guarantees that this local approach will work; in fact, Vandenhouweele admits that failure is not only accepted but expected within the organization. “We have a significant failure rate, because I am only looking for things that have never been done before,” he says. “Sometimes it takes three to four years to get to proof-of-concept, and sometimes it takes a couple of months; there’s a huge variation.”

PASSION

Just as important as the locally-driven, “bottom up” approach, is finding passionate leaders for innovative initiatives.

In the beginning, Vandenhouweele says he selected regional innovation leaders whose more senior status and credibility within Merck might help get innovations implemented. Unfortunately, that was “a total failure,” he says.

Vandenhouweele found that these high-ranking managers have so many responsibilities that they often have limited capacity. More importantly, Vandenhouweele found these managers didn't always have an affinity for innovation. For example, those who move up the corporate ladder often are great at seeking out for efficiencies and adjacent opportunities. But those characteristics, say Vandenhouweele, are not necessarily what you want in a champion of innovation and further-out ideas.

Instead, Vandenhouweele began seeking out specialists in a particular area, some of whom were very junior in that country's organization. "I've seen examples of someone who was four levels below the managing director," he says, "but made a major change in that country because she was so passionate about it."

In one particular case, Vandenhouweele says a lower-level executive from the company's Venezuelan team had devised a simple plan to promote innovation by showcasing examples of successful Merck programs from Venezuela and the rest of the world. She even persuaded management to do a company-wide meeting to promote the program, and launched an annual innovation competition,

with awards and incentives for winners. She kept the program top of mind, even getting the managing director from her region to include her new innovation logos in his speeches.

"She made an enormous change in the organization," Vandenhouweele says. "I see this repeatedly in other countries," he adds, noting that this approach has allowed him to identify high-performing individuals that may be under-the-radar. "I go away from the requirement of the level of authority, and focus on each person's absolute passion."

Ultimately, investing in innovation is about delivering results, and Vandenhouweele says working with passionate leaders helps get the company there. "If you have passion for a solution, you're going to go after it and you're going to find the time, resources, colleagues, and collaborators," he says.

Vandenhouweele says he tries to nurture and promote these individuals as much as possible. That often means removing barriers to innovation, and showcasing their successes to management or colleagues. "Sometimes they're so passionate about their initiative, they cannot let it go," he says. "They cannot accept that it fails. That's the

Merck facility in Germany. Photographer: Armin Kübelbeck, CC-BY-SA, Wikimedia Commons



downside of it.” He says this is manageable by trying to help them with some simple metrics, and help them understand what they learned from an initiative and how to move on.

Vandenhouweele also inspires his teams with monthly calls with the entire innovation network, in which they share ideas, initiatives, or programs that different countries are implementing. This is intended to instill pride in these individuals, and inspire them to replicate a program that is showing traction in another region. When he brought the aforementioned Venezuelan innovator on the call, “suddenly she became a celebrity,” says Vandenhouweele. “That was another reinforcement to continue to do it.” Now Vandenhouweele says he sees that replicated all over the world. “I see it in Turkey, South Africa, Mexico... all over the place. Those models are infectious.”

PROCESS

Vandenhouweele isn’t opposed to all processes... just those that can create innovation logjams.

“One of the first things traditional managers ask when someone comes up with an innovative idea is, ‘What is the ROI?’” he says. “Of course, very often you have no clue, because you don’t know if something is even going to work.”

As a result, Vandenhouweele has worked hard to streamline the ideation, feasibility evaluation, and pilot stages. “In the front end of innovation, I recommend as little process as possible,” he says.

To accomplish that at Merck, he developed a simple framework to help teams quickly identify innovations, examine qualitative assumptions, and work through feasibility issues. He developed worksheets that allow a country innovation team to define a problem in two minutes, and then help them through a quick and low-cost feasibility test. “If it fails, it fails quickly and cheaply,” he says. “If it works or there are some adjustments, you adapt it a little bit and then you go forward.”

Vandenhouweele’s streamlined system ensures innovators talk to stakeholders, collect feedback quickly, validate key assumptions, and make course corrections as needed.

This approach helps maximize participation and productivity. “If you need ten steps and three forms to fill in for every idea you have, nobody is going to do it,” he says. “They just give up and they lose all interest.” Vandenhouweele’s role often entails helping the innovators clear obstacles, whether political, financial, or technical.

But he acknowledges that minimizing process can be tricky on a global scale, especially when it comes to regulatory or compliance matters.

Vandenhouweele’s “light on process” approach has evolved to engage early legal and compliance departments, which play critical roles in Merck’s core business. Similar to approaches utilized by PwC, Adobe, and others, Vandenhouweele has developed partnerships with those functions to speed innovation without too much bureaucracy. “I don’t want a blessing or approval [from legal], but they can say to the innovators, ‘Watch out for this,’ or ‘If that is your objective, then this is how you could approach it.’” This sense of cooperation has eliminated some barriers to innovation internally. “I’m trying to create that collaboration and trust between those teams, without creating a process; it’s more of a partnership offering guidance.”

The same goes for information technology, where innovators work with IT to ensure a concept can be built and sold properly, and that intellectual-property issues have been considered; Vandenhouweele says IP issues can differ from country to country, and can quickly get complicated, especially if a third-party vendor is involved.

In the end, Vandenhouweele acknowledges that the global innovation challenge is a complex one that takes time. “I know the culture of the company is very hard to change,” he says. “It’s like little flames that I try to [light] across the organization, and hopefully that’s going to create a big fire, which will then change the culture.” ♦

PROJECT EXAMPLE

In one country, Vandenhouweele’s team was faced with a particular challenge: high demand for Hepatitis C products, but little patient ability to pay out-of-pocket. “Because of local cash flow issues,” says Vandenhouweele, “only a very small percentage—about two percent of the population — could afford the product.”

The local Merck innovation team participated in the ideation, stakeholder engagement, and testing activities outlined in this article, and quickly realized that the innovation needed was actually a financial one; namely, a relationship with a bank that could provide each patient with a loan.

The solution turned out to be a win-win for everyone. Patients were able to benefit from the full six-month treatment period, but could finance the treatment over as long as three-years. “Because of this approach,” says Vandenhouweele, “more than 45 percent of the patients could afford the product.”

Similarly, there was an important “win” for the bank: the ability to develop relationships with a new group of customers. That’s because most of the patients were living in remote areas, and had no financial history or established relationship with a financial institution. “They didn’t have typically banking access,” Vandenhouweele says. The Merck partnership therefore became an important bridge for the bank, enabling it to reach new customers to whom they could offer a more diverse set of financial products.

Vandenhouweele says the success of the innovative vaccine-financing program has the potential to expand elsewhere. “When we showed it works for the patient, the partners, and the company, we started to look at other countries where we could scale it.”

How Express Scripts is Using Data to Try to Predict Healthcare Problems

BY STEVEN MELENDEZ, CONTRIBUTING WRITER



The Express Scripts lab in St. Louis opened in 2010.

In 2013, the U.S. healthcare system spent more than \$300 billion addressing the consequences of patients failing to take drugs they were prescribed, according to research from pharmacy benefit manager Express Scripts. That's a massive number—and a big issue that the St. Louis-based company is tackling at its Express Scripts Lab. The lab, which opened in 2010, roughly tripled in headcount last year and now houses more than 100 employees. One area of focus: working with data to better predict which patients will need extra nudges to stick to a medication regime. “The mission of the lab is very much aligned with the mission of our company, Express Scripts, and that is to make drugs safer and more affordable for our plans and our members,” says Mark Bini, the company’s vice president of new solutions. “We have a research and advanced analytics team that takes mounds and mounds of data, mines that data, and develops meaningful insights from that data.”

USING DATA TO HEAD OFF PROBLEMS

Since Express Scripts manages drug benefits for about 85 million Americans, it has enough data to identify more than 400 factors that can help predict how well patients will stick to their prescription regimes. Those factors range from demographic categories like age, gender, and zip code, to facts like how regularly they and others on the same insurance plan have filled their prescriptions in the past.

The company’s statistical program, called ScreenRx, can predict up to a year in advance which patients won’t stick to their schedules, including those who are taking drugs for chronic conditions like diabetes or congestive heart failure.

“We almost look at non-adherence as if it’s a medical condition,” says Bini.

The program, launched in 2012, also aims to find the right ways to preemptively keep each of those at-risk patients on track and out of the hospital.

“What we’ve done over the past several years is really honed our intervention strategy to make sure that we’re offering the right solution to the member, based on the root cause of non-adherence,” says Bini.

If patients are simply having trouble remembering to take a daily pill or finding the time to pick up a monthly refill—some of the most common issues—the company can help them shift to a mail-order pharmacy or provide them with simple timers that chime when it’s time for a dose, Bini

says. If the issue's cost, the company can suggest cheaper pharmacies or generic alternatives, and if patients experience side effects, the company can put them in touch with one of their specialized pharmacists, he says.

"If it's someone who's having adverse side effects, we're going to put them in touch with a pharmacist who treats that condition every day and can help them through those side effects and also help them understand why they're on that medication," he says.

BACKING NEW PROGRAMS WITH FINANCIAL GUARANTEES

In general, Bini says Express Scripts looks to have its lab programs go beyond mere data collection and analysis to actually create and test pilot programs aimed at delivering concrete benefits to patients.

"We don't believe that big data's enough," he says. "That data has to be actionable on behalf of our clients and our members and also our other constituents."

That's why the lab houses not only statisticians and insurance benefit specialists, but also hosts pharmacists and nurses who directly interact with patients. The company encourages patients with complex and chronic diseases to consult by phone with pharmacists specifically trained on their conditions. Working alongside those health professionals are behavioral scientists who can rapidly roll out and quickly quantify the successes of new programs of various complexity.

"If we're trying to just reframe the way that we speak to patients on the phone, we can quickly go up to our therapeutic resource center in the lab and do what we call a snap trial," says Bini.

A quick test like that would likely just involve behavioral scientists sitting alongside pharmacists speaking to patients on the phone. According to Bini, something like this is easy to arrange, as all specialists work in the same building.

Results of experiments are then disseminated through the organization and put into practice, says Bini.

COMMUNICATING INSIDE THE COMPANY—AND OUT

"We have monthly updates that we provide to not just the senior level folks at our company but all folks at our company," he says.

Bini, who reports to the company's senior vice president of clinical, research and new solutions, gives monthly webinars and sends e-mail updates on the initiative throughout the company.

The lab also makes many of its results available to the public, through a mix of peer-reviewed journal articles, white papers and other publications, including its widely-cited annual Express Scripts Drug Trend Report, which monitors changes in U.S. pharmaceutical spending and prescribing.

And employees throughout Express Scripts, as well as representatives from the insurers it works with, are invited to visit the lab and see what researchers are working on.

NEXT ENDEAVORS

The company also works with insurers to develop and conduct its larger trials and projects—something that's made easier by the fact that plans generally sign long-term contracts with Express Scripts, and will reap the benefits of cost and health improvements for years, says Bini.

"Most of the things that we've developed have required progressive clients that are able and willing to try new things with us," he says.

One ongoing project looks to find reliable statistical ways to identify patients who are at risk for opioid painkiller addiction, well before they're having issues with the drugs.

Addictions stemming from legitimate painkiller prescriptions are tremendously costly in both health and financial terms, and many patients aren't aware of the dangers and warning signs, Bini says.

The company is also working on smarter technology to measure blood sugar in diabetes patients, recording levels over time using a smartphone app that connects to a Bluetooth-enabled glucose meter. If there's a dangerous reading, the system can even warn the patient or a caregiver in real-time.

"This app that is on the patient's phone is cloud-based, and it sends the information in a secure fashion...from the meter to the phone to Express Scripts," Bini explains. "They'll also be able to monitor their carbs and their exercise and their medication as well."

The lab plans to expand its IT capacity in the next few months, he says, bringing on about 50 specialists like developers and designers. It's also conducting focus group-style usability tests with consumers.

"We're going to be really kind of investing more in this space, because we really believe in this model," says Bini.

When it comes to communication and getting different constituencies at Express Scripts to work together in new ways, he says, "We've broken down silos." ♦

Inside J&J's New Initiative to 'Intercept' Diseases

BY SCOTT KIRSNER, EDITOR



Ben Wiegand,
head of J&J's Dis-
ease Interception
Accelerator

The pharmaceutical industry typically develops new drugs to help manage diseases. But a new project inside Johnson & Johnson posits a different model: what if you could identify people at risk of developing a disease, and create products to stave it off?

The question is the driving force behind the Disease Interception Accelerator at J&J's Janssen Research & Development division in Raritan, New Jersey. It originated with Bill Hait, the Global Head of Janssen R&D, who wanted to test out a new paradigm for the pharma industry. Instead of "disease care," this would be true "health care."

Already, notes Ben Wiegand, head of the Disease Interception Accelerator, there are a few examples of treating someone before they've been officially diagnosed.

In one example, if a person has diabetes and high cholesterol, "we know that they're headed toward heart disease, and so we provide them a statin," Wiegand says. "We've made a tremendous difference in intercepting that disease before it happens. Same with aging and people having bone density issues—we give them Fosamax [to build bone] before they suffer a break."

GOING "OFF THE GRID" TO EXAMINE 80 DISEASES

Ben Wiegand, Head of J&J's Disease Interception Accelerator, gave Wiegand, a former head of open innovation at J&J, free reign to "be off the grid, and be a separate group" in order to approach things differently.

Governance of the new accelerator consisted of Hait and his Chief Financial Officer, Chris Picariello. "We make decisions faster than I ever have within J&J, and we have access to Bill 24/7," Wiegand says. "When we need to spend or make decisions, we have quick access to them. When we can show value creation, we can access more resources." They also keep the Chief Scientific Officer of J&J, Paul Stoffels, apprised of their progress.

"We wanted to explore what would the future of intercepting disease look like—the types of competencies and capabilities you're going to need," Wiegand says. Working with the consulting firm Innosight, Wiegand says he began to "think through a 'future back' approach. Even though our first product might not hit the market until the 2020s, what are the success stories in 2016 and 2017 that will show that we're on the right path?"

A first step was examining more than 80 dis-



eases to find those where there was a useful signal that could help identify people who were susceptible to developing a disease, and potential targets that a drug might hit to delay its onset. “We didn’t want this to be a research exercise, and we wanted to avoid solutions that we would have to invent de novo, if we could,” Wiegand says. That led to identifying six diseases “where we felt like we could identify people who were at risk, and we had at least a hypothesis about progression markers” that would indicate how quickly or slowly the disease was proceeding.

SMALL TEAM, LOW EXPENDITURES

The team, initially, was just Wiegand, who has a PhD

in chemistry, and David Yazujian, who focused on strategy and operations. “We wanted to maintain a very small footprint because we’re early in our process,” Wiegand says. “We want to manage our capital outlay.” In 2017, the DIA is just 11 of J&J’s 127,000 employees. “We have lots of people at J&J with deep expertise, and very innovative people,” he says. “At least 70 people are helping us on an on-going basis because they have ideas—they see this as the future. Our vision of transforming medicine resonates with people. They may send us people to talk to, or diseases to think about.”

An early focus for the accelerator is Type 1 diabetes, sometimes called juvenile diabetes, which affects roughly 20 million people globally. It can be spotted early by examining a gene family called

Murray McKinnon, Global Head of Janssen Immunosciences, with Ben Wiegand and Sandy Nissenbaum.

HLA, and Janssen is already conducting a clinical trial of a drug that is currently on the market for immune-related diseases, Simponi, to see whether the injectable drug can slow down the loss of pancreatic cells that secrete insulin; their death leads to problems processing sugar. “We’re hoping to delay the onset while we work toward the ultimate goal: stopping progression toward the disease,” Wiegand says, even if “the first thing out of the gate won’t be the final solution.” A phase two trial got underway in mid-2016.

The Disease Interception Accelerator seeks out collaborations with academic researchers and startups outside of Janssen’s walls. “Today, we have 30-some collaborations in Asia, Europe, and throughout the U.S.,” Wiegand says. “We want to work with the best people, whoever they are.” The DIA’s current model is “one person per disease state,” meaning one internal person searching out and coordinating with external entities; in the case of diabetes, the lead is Joe Hedrick, a former research leader at the JDRF, a nonprofit focused on Type 1 diabetes.

GETTING VARIED GROUPS TO WORK TOGETHER

To craft contracts for most of those outside collaborations, Wiegand’s team got legal and finance help from the staffers at J&J’s network of innovation centers, as well as other groups around the company. “We don’t have our own contract, regulatory, or health policy groups,” Wiegand says. “So we’ll leverage J&J’s infrastructure, until we hit critical milestones.”

“When we talk to people outside the company, whether patients or consumers or doctors, they look at us as J&J,” Wiegand says. “So they expect us to be working together. They assume there are no silos or divisions between the different organizations or companies here. That’s what they expect, and that’s what we’re trying to work toward.”

CONNECTING WITH PATIENTS

A big part of the DIA’s approach has involved working with patients, patient advocates, and even people who blog about diabetes. Wiegand says he wants to build a community that will not only understand his approach, but provide input as the team tries to bring new treatments to market. The team has organized webinars and conference calls to explain what they’re doing, answer questions—and ask questions of the participants.

“Most of these bloggers have kids with Type 1, or they’re suffering from it,” Wiegand says. “So we were

trying to understand things like, what was your experience? When did you know you had the disease? If you would’ve known earlier, what would you have done? Would you have been willing to go through surgery? Take a medication? Would you help us get the word out? Now, even the Food & Drug Administration is looking for the perspective of the patient, and not just clinical data, when you submit something for approval. They want to understand what the trade-offs are. And we wanted to be sure the marketplace would be willing to accept what we were thinking about.”

Participants asked tough questions, and there was definitely some skepticism about whether the effort could succeed, Wiegand admits. But “we’re trying to create a business not all by ourselves, but trying to get the community to come alongside,” he says. That will take work, and the team is planning to organize another webinar for the patient community in 2017.

The DIA team is also working with national governments in countries like Singapore and Finland—countries that have a high prevalence of diabetes, and have made high-profile commitments to develop treatments. “We’re trying to get footholds in a few countries to prove that this model works, and then cascade it around the globe,” Wiegand says. “Once you have those early proof points, it’s easier to scale afterward.”

“We wanted to explore what would the future of intercepting disease look like—the types of competencies and capabilities you’re going to need... Even though our first product might not hit the market until the 2020s, what are the success stories in 2016 and 2017 that will show that we’re on the right path?”

BEN WIEGAND, HEAD OF DISEASE INTERCEPTION ACCELERATOR, J&J

Diabetes isn’t the only disease that the DIA is working to intercept; there are activities looking at cervical cancer, perinatal depression, cataracts, and others. And the expectation is that delaying—or preventing—the onset of disease won’t just rely on pharmaceuticals, but may involve behavioral solutions, nutrition, exercise, or other approaches.

Bill Hait, the original catalyst behind the DIA, says that the project is delivering on his original vision. “The groundwork Ben and his DIA team have been laying during the last two years has the potential to change the way we look at health care forever,” Hait says, “away from today’s ‘disease care’ towards true health care in the future.” ♦

Medical Devices & Instruments

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At Medtronic's Applied Innovation Lab, Working Closely with Business Units and Going Global

BY SCOTT KIRSNER, EDITOR



Brian Bechard,
Technical Fellow,
Medtronic

Before Medtronic's Applied Innovation Lab existed in brick-and-mortar form, it was constructed out of cardboard. "We ordered 40 sheets of four-by-eight cardboard," explains Brian Bechard, a Technical Fellow at Medtronic.

"Everything we wanted in the space was put together in cardboard first, before we created CAD drawings and then the physical environment."

To create a new space for prototyping the future of healthcare experiences at home and in hospitals, why not start out with a cardboard prototype?

The Applied Innovation Lab opened its doors in September 2015, with a goal of helping Medtronic evolve from being simply a maker of medical devices like pacemakers and stents to one that is thinking more broadly about improving health and patient outcomes. In the two years since it opened, there has hardly been a quiet moment at the lab—and there has been so much demand from different groups in the company that Bechard and the rest of the team at the lab have had to create screening criteria for what they will work on.

THE LAB'S FOCUS

The seven-person team that operates out of the lab sits under Medtronic Chief Information Officer Michael Hedges. Team members have backgrounds in design thinking, business strategy, engineering, and clinical research, explains Scott Mark, a former Director of Healthcare Innovation at the company.

Explaining the motivation behind creating the lab, Mark says that in the years since Omar Ishrak became CEO of Medtronic in 2011, "we've increased our focus on patient outcomes. Omar has focused us on understanding economic value in what we do, and in being more of a solutions-oriented company, not just a medical device company." Mark says that creating a place to practice human-centered design would be a way to help Medtronic's various businesses move in that new solution-oriented direction.

"It put a really heavy onus on us, from the beginning, to deliver what the business units would see as meaningful value," explains Mark. "We didn't want to just be a space, or to just be workshop facilitators, providing a transient opportunity for people to think differently. We wanted to build up a robust internal consulting capability, with hard deliverables as an output, so that teams could bring something back and continue working on it in their business."

A centerpiece of the 2,200-square foot space is a 360-degree video projection screen that drops from the ceiling. The team often goes out and uses

GoPro cameras to gather from different healthcare environments—like a hypertension clinic in Ghana, or an emergency room in Los Angeles—which allows the lab to immerse people in what feels like a realistic patient experience. “It’s very different from putting on virtual reality goggles,” says Bechard. “You can ask questions, and have it be social. You’re there with 10 of your peers, and you’re all looking at the same thing.”

The innovation team that created the lab knew they didn’t want to create a showcase for cutting-edge technology or a “tour stop,” in Bechard’s words. “This is a working space, a team space. There’s always activity in it, and things up on the whiteboard – pictures, or itineraries for upcoming visits in the field.”

HOW THEY WORK

Much of the work that happens in the lab is less about creating prototypes of new medical devices or new apps for doctors, but rather experience design and solution design. One example involves helping medical professionals manage patients with hypertension and heart failure in emerging markets—using tablets, mobile phones, and in-person interactions. Storyboards are a commonly-used tool for mapping out the patient journey, and his or her interactions with the healthcare system.

“Everything we build at the lab is a sacrificial concept,” explains Bechard. “There are going to be flaws and things that aren’t right. What we’re doing is looking for a reaction—someone who says, ‘it needs to be more of this, or less of that.’ We want to have honest dialogue. But the idea is that we don’t spend months and hundreds of thousands of dollars developing a beautiful prototype that looks like it is commercially-ready.” Instead, the Applied Innovation Lab aims for “crude and rapid prototypes.”

Initially, the lab worked on a roughly equal mix of its own projects and projects for different business units around Medtronic.

But in its two years of existence, the balance has shifted dramatically. “Today, only about 10 percent of our time is devoted to our internal projects,” Bechard says. The other 90 percent involve collaboration with a business unit team, which can often involve insurance companies, technology vendors, and other outside partners

Some teams may be resident in the lab for two months or more to flesh out a concept and gather data from the market; others might come in for a more focused day-and-a-half session.

“There are times when we’re helping a team get over a specific hurdle—like doing some de-risking

on a specific project – and we may plan in advance to get the background material, do some up-front field work, and just jam on it for a short amount of time,” Bechard says.

The lab crew also holds regular “office hours,” when teams from around the company can drop by, and get advice or recommendations on projects. “That’s one way to distribute our impact around the organization,” Bechard says.

It’s key, he adds, that the lab works closely with business units and “speaks the language of the business,” he adds, “so that our credibility is built up over time. They are focused on keeping the engine running – and we’re trying to provide value in ways that may not have been explored before.”

There isn’t an insular attitude at the lab of “let’s do something and then throw it over the wall to the business,” Bechard says.

GOING GLOBAL

As the lab has begun getting involved in projects outside of the US, it has also expanded its team to include seven “extended team members” in regions like Asia-Pacific and Europe. So in addition to a weekly team meeting in Mounds View, Minneapolis, where the lab is based, “we’ve just begun to do a monthly call with the extended team members, highlighting specific projects in places like Singapore and China,” Bechard says. Knitting together a geographically-distributed innovation group, he adds, “doesn’t happen by itself; you have to be deliberate about it.”

“We didn’t want to just be a space, or to just be workshop facilitators, providing a transient opportunity for people to think differently. We wanted to build up a robust internal consulting capability, with hard deliverables as an output, so that teams could bring something back and continue working on it in their business.”

BRIAN BECHARD, TECHNICAL FELLOW, MEDTRONIC

As an example of how the lab is working with constituencies around Medtronic, and around the world, Bechard brings up a project that started with the company’s minimally-invasive therapies group, based in Boulder, Colo.

“They came to us to think through market readiness for a new patient monitoring solution, and they needed a first launch site or testbed,” Bechard says. “This was a solution that was potentially disruptive to our current mature markets, and so they told us that they wanted to look at emerging markets.”

Two they wanted to examine were India and China. Bechard was the project leader at the lab, “and we had extended team members in Shanghai,” he says, “and the main business sponsor in Boulder. The group that was local to the Chinese market let us go into the field and talk to anesthesiologists—walk into the NICUs and PACUs [neonatal intensive care units and post-anesthesia care units] to better understand the jobs to be done and the needs there. Just understanding the complexity of [how procurement happens in China] was very valuable. For example, it can be easier to buy capital equipment in china, versus trying to sell a piece of software.”

At any given time, the lab tends to be juggling between 30 and 40 different projects. But since it opened in 2015, a queue of more than 50 other projects has built up, all vetted by the team as “a good match for our capabilities,” Bechard says. And there are plenty of other people among Medtronic’s 90,000 employees eager to spend time there. “Demand has definitely increased,” Bechard says.

So the lab has been honing its criteria around

what kinds of projects it chooses to work on. “We always emphasize that we want to be involved very early — at Phase 0 or Phase 1, helping to develop the challenge statement and getting everyone pointed in the same direction,” Bechard says. Projects need to be relevant to the lab crew’s expertise and skill set. “We are also trying to focus on funded and supported projects within businesses,” he explains, as opposed to pet projects of a single employee or “science fair”-type explorations.

Bechard and his colleagues know they’re only two years into a long journey.

“We talk all the time about putting the patient or end-user at the center of our process, and developing empathy and understanding of how they work, and their needs,” he says. But in doing anything new, he says, “you’ve got to be mindful of the corporate culture. We can be very qualitative at times, and it can be very quantitative, and market research driven. So we’re chipping away at this piece by piece. It takes time to turn the ship, to develop trust, and to bring in new mindsets.” ♦

About 90 percent of projects at the lab involve collaboration with business unit teams from around Medtronic.



Letting the Voice of the Customer Drive Innovation at Beckman Coulter

BY KELSEY ALPAIO, ASSISTANT EDITOR



Beckman Coulter Biomek NXP laboratory handling robot. Photo by Nadina Wiórkiewicz.

How do you get a well-respected, 80-year old maker of laboratory instruments to embrace the cloud and the Internet of Things—stat? That's the task facing Wido Menhardt, VP of Clinical Informatics at Beckman Coulter, headquartered in Orange County, California and part of the \$17 billion Danaher Corporation.

Menhardt spoke with Innovation Leader about getting the organization to take the cloud seriously; how the company uses employee hackathons to explore new technologies, languages, and platforms; misconceptions about technology adoption in emerging markets like India and Africa; and letting the voice of the customer drive innovation.

...

WHAT WE DO

We are in this business of testing blood and other fluids for a large variety of markers, chemistry, like lipid panels, or immunochemistry, like viruses, or hematology, like your white blood count, or microbiology, looking at bacteria.

We do about 10 billion tests a year...With that, we probably touch over half a billion people each year. For these are just approximations, but one thing that's said in this industry is that 70 percent of medical decisions are based, in part, on blood tests.

It's a huge impact that our instruments, and the results they produce, have. It accounts for only about something like two percent of health care costs. It's a huge cost benefit ratio.

That's the same for IVD [in vitro diagnostics.] We have a full range of instruments that a clinical laboratory would need. Clinical laboratories are typically either in the hospital, that's for in patients, typically.

Then there are commercial labs—like a Quest or something—where typically when you're doing your annual check up, that's where the samples go to and where you get the results from. We can equip both with our instruments.

Now in addition to just having the instruments, we don't want the lab techs to go around with pencil and paper and taking note of what the instruments need. In addition to that, we provide sophisticated software that helps orchestrate this.

The way it works is that somewhere, somebody creates an order. Maybe in the hospital, maybe your doctor. It gets entered into some software system, and that then arrives at our software, which then makes sure that all the instruments know which

instrument has to do which test for which blood sample for this particular patient.

That's orchestrating things on the incoming side. Then when the results are available from all the instruments, then our software goes into, if you wish, intelligence mode, where it does many things, but it does two very important things for the lab.

HOW WE'RE ORGANIZED

We are organized in business units that focus on certain things. There is a business unit that's for amino acids and chemistry, and a business units for hematology. The business unit that I'm in focuses on informatics and other automation solutions. That's my little box.

But with next generation software, I'm also responsible for the basic software platform for our next generation instruments. Those next generation instruments, we obviously want to have user interfaces and usability that's comparable to our Cloud solutions.

We want those instruments to be connected to our Internet of Things solution and send really valuable data there so they can service better but on the other hand so they support next generation analytics, whether it's clinical or predictive analytics of failures, etc.

CONNECTED INSTRUMENTS & THE CLOUD

[Currently, our] software is installed on PCs in the lab or servers in the lab, etc.

We've made a strategic choice about a couple years ago, to take our solutions into the cloud. All of our instruments report data via Internet of Things into the cloud. We probably have more than 10,000 instruments connected to the cloud that send enormous amounts of data every day.

On the back end, if we put all of the data into the cloud, provide several advances to our customers. One is that if the solutions are in the cloud, they can access it anytime, anywhere. Whereas right now they have to go through a PC in the lab. Now they can look at it in the cloud. They may be at different locations in the lab or in the hospital. Maybe ultimately at home.

All of those obviously have to be managed from a regulatory perspective. Another advantage is, if you have all of the data in the cloud, you can also do data analytics. Look at patterns or inferences from all that data that you're getting.

Right now, the data is in a PC or in a server in one lab. If the hospital has many labs, then aggregating that and ultimately even looking at comparing

data from different labs. For example, if different labs could compare the results for similar tests with similar chemistry, then they could actually have some sort of a peer comparison.

Finally, if you have them in the cloud, that's operationally much easier for us and the customer. We can much more easily install and support the software. That's a benefit to us but also benefit to our customers.

[But for us,] software is relatively new, cloud, and Internet of Things is even more new.

A couple of points. One is that within the company, talking about using the Internet to support a laboratory, the first hurdle that you hit is that people don't think that Internet is reliable enough, Internet connectivity is reliable enough for a laboratory.

“We've made a strategic choice about a couple years ago, to take our solutions into the cloud. All of our instruments report data via Internet of Things into the cloud. We probably have more than 10,000 instruments connected to the cloud that send enormous amounts of data every day.”

WIDO MENHARDT, VP OF CLINICAL INFORMATICS, BECKMAN COULTER

Somehow, they feel that in this domain it's all different, even though in reality in their personal lives and even their professional lives, they use the Internet for their banking, for their shopping, for entertainment, and really indeed, the uptime of the Internet for those purposes is highly satisfactory, I would say.

HOW TO THINK ABOUT EMERGING MARKETS

Another thing that's interesting is that sometimes people will then say, “Yeah, maybe in the U.S. But in emerging markets perhaps not.” Emerging markets are very important to us, China is a huge growth market for us, and further down the road, India and Africa.

People think that, “Oh, but if you're somewhere in rural India you won't have Internet connectivity,” but the reality is that mobile Internet penetration in emerging markets is huge, in particular wireless. You'll find people with smartphones anywhere in Africa, anywhere in India, and in western China.

There are solutions that people are putting in place for Internet connectivity, even in emerging markets, maybe even in some cases more so than in developed markets. The other thing is that people in emerging markets are very resourceful.

In my previous role, I did a bunch of work in

healthcare solutions for India and for Africa. In Africa, for example, I'm four hours away from the nearest hospital, which also hardly deserves the name and a local health clinic which mainly catered to pregnant women and vaccinations and those kind of things. We had put in place a solution for ultrasound for pregnant women so they would know whether they would have a risky delivery.

But we didn't have skilled ultrasound people everywhere in rural areas. We, in some of these healthcare centers, we put in ultrasound machines, tell somebody how to run the ultrasound probe over the belly of the pregnant woman. But the interpretation would have to happen in that four hour distant hospital, and there was certainly no wireless Internet in that healthcare center.

What they did is they took a very long pole, like 30, 40 feet long. On the top of that they mounted a 3G antenna. With that, they were able to send the images to that remote hospital. They're just very resourceful. It doesn't have to be perfect, but it works.

HOW OUR GROUP IS DIFFERENT FROM IT

Another change process is IT. In a company like ours there is a corporate IT department and that obviously runs financial systems and our email and our websites and our general ERP systems, etc.

In a company that's focused on instruments and chemistry, and I find this interesting because as a software guy I come into this company. Traditionally, people's intuition when it comes to software is to go and call corporate IT, even if it's about software solutions that we sell to our customers.

Corporate IT is focused on delivering better service at lower cost every year. They're trying to use their costs to offshore things, etc. Better service at lower cost. That's their focus. Our focus, on the other hand, is providing more value to our customers, expanding our footprint, driving the top line, driving the revenue, more solutions, better value for our customers. It's a very different focus than corporate IT. Neither is bad. Each has its own focus for a different need.

But crystallizing that within the company and explaining that if we develop and support products for our customers, we have to use one sort of information technology strategy. Whereas if we support our internal users with email and ERP systems, it's a different information technology strategy, and they don't align too well.

REGULATORY AFFAIRS AND RISK

[Regulatory affairs] is something that is very, very

important in our company, because our products are highly regulated. It has to go through high regulatory bars for approval. Then for surveillance. Periodic audits, etc. That's part of the DNA of the company. People are very focused on complying with the regulations.

That means a lot of documents, a lot of approval cycles. These things take a long time. But on the other hand, some of the software technologies that we are trying to push out are either not regulated at all — some of the operational software technologies, for example. If we provide customers with a dashboard of how much testing they do and which instruments at which site, that's not regulated.

Other software technologies that we have are of relatively low risk and low concern from a regulatory perspective, so we could for those move in principle much faster with much more frequent updates, maybe even as fast as once a month, which in this industry is very, very fast.

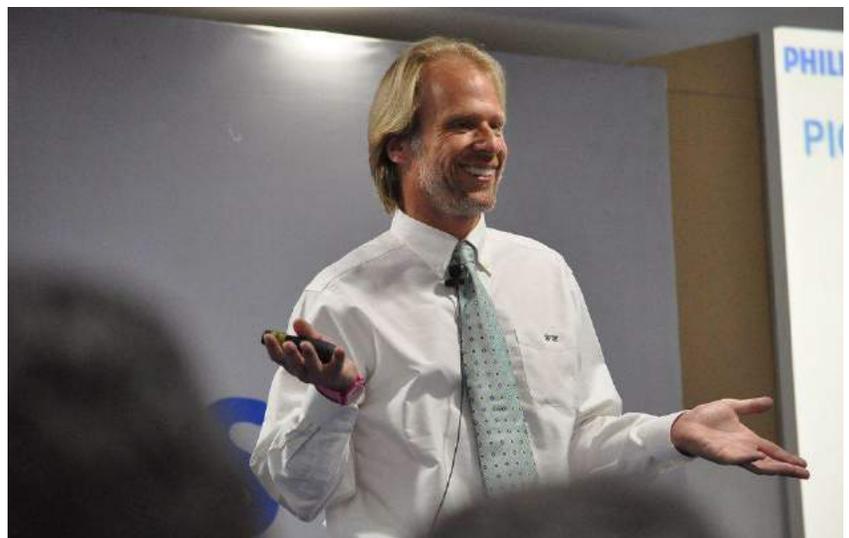
Of course, if you look at Facebook or Google, they do it several times a day. But even getting to a month, in an industry, where regulatory methodologies and habits have been entrenched, is difficult.

Distinguishing between what is important to have a lot of documentation and very diligent approval cycles, on the one hand, and then other things that can move very quickly, is difficult. Making sure that we don't brush everything within the same brush within the company is a big change for us, even for our internal organizations and systems.

SECURITY IS LIKE AN ONION, NOT AN M&M

Another change management topic is security and privacy, because that's always a topic that comes up when people talk about the cloud. Two things

Wido Menhardt, VP
of Clinical Informatics,
Beckman Coulter



there. One is that the traditional IT approach is to create impenetrable firewalls, and often lots of passwords and virtual private networks, etc. Try to have a perimeter around the organization that nobody can get in, and that way we're safe.

But with a strategy that takes us into the cloud with lots of interconnectivity from our instruments, via Internet of Things, into our back office, into the cloud, and then to customers, it's no longer simple to have a wall around you.

We've changed our security strategy to be rather than having an M&M, where you have a hard shell and then once you're through the hard shell you're in the middle and everything is soft, instead of that we're using a strategy that's more similar to an onion, where every onion peel, we have a security strategy for that. Every element in our solution, whether it's a disk or a network or a user, everything has its own security mechanisms built in.

When I talked to customers, initially there seemed to be a lot of concerns about taking healthcare solutions into the cloud. Customers are concerned about security, privacy, etc., but I decided to do voice of the customer with the hospital CIOs, to see what they think about it.

As it turns out, their main concern is dealing with companies that don't know what they're doing, that don't take security seriously. There have been, as you probably know, lots of breaches in the healthcare space. ...But if somebody actually does know what they're doing, has a good strategy, gets certifications for that from a third party, then the household CIOs are quite happy with the cloud solutions and they're quite commonplace.

This is an important finding and an important way to communicate this kind of change internally in the company as well, because internally people also hear about security and privacy as a concern and maybe cloud is what we should be doing as a company. But as it turns out, it's consistent with what our customers want as well.

HOW WE USE HACKATHONS

One more thing is change management within R&D. My primary job responsibility is R&D and strategy. In R&D, we have extremely high retention. We are a company that's a good place to work and many of our R&D staff have been with us for a very long time, and enjoy what they're doing. They come to work every day helping to improve the healthcare of every person on the face of the earth.

But going to the cloud requires many new technologies and tools, new languages, new networking technologies. Privacy and security is also part of

that, but in particular on the web there's always new stuff that makes it easier to develop solutions and connect them and use mobile applications to link it with that...

Some of the teams, in particular in software, may not have been exposed to those, because primarily they've been working on software that runs instruments, often embedded, but certainly on premise, on the instruments. Moving people who've been in that space for a long time to help them to appreciate and learn these technologies is sometimes a challenge.

What we've done [is organize] hackathons inside the company. We say, "We're going to take this concept and we'll develop a cloud based solution for that. What technology are we going to use for that?"

...We invite five or six teams of two or three people into a room for a week every day, and these teams, we ask them to come with their preferred technology towards doing things, [whether it is] Python or React or whatever.

Then in the room every day we say, "OK, today we want to solve the following problem. I don't know, user logging, or displaying 10,000 points from a particular assay on the screen, etc." During that day, each of the teams goes away and hacks it up... and at the end of the day they compare the solution. How does it work? What were the problems they had? Look at some source code, etc. Then towards the end of the week there's an emerging consensus of what sort of technology to use. It's awesome, because it's fun, people are engaged, people feel that they had a say in what we're going to do.

At the same time, we've solved the business problem as to what is the platform we're experts on.

DON'T TRY TO DO EVERYTHING

We thought that some things could be done exclusively from the cloud, and by getting feedback from experienced people that work in the field, we had to accept that some things cannot be done in the cloud, at least for now.

We stepped back and said, "OK, maybe for certain situations we need still one, little, on premise box that does things, for example for speed of communication between devices or maybe as a backup, should the cloud go down."

There are certain things where we sat back and said, "OK, we're not going to crack this nut," sometimes because we thought we might have one conviction, but, for those particular cases, we don't have the evidence to prove that it all works so it's better to take it one step, release that to the market, and then see how that actually works, and take it from there.

THE VOICE OF THE CUSTOMER

The mantra in many companies like ours is, [let the] voice of the customer drive your innovation... Conversations with the customers are extremely important. ...I have one beautiful, beautiful story that I just love.

I was in Australia at a customer visit. In the meeting were both the head of pathology, so that's the doctor, who is responsible for the results and all that, and the quality. Also in the room was the lab director. This is the person that manages all the lab techs that operate instruments and also the software.

The conversation went on for some time with the pathologist, on high level strategic issues and clinical and quality related issues. Then at some point, after half an hour, the lab director piped up and she says, "My employees, they are on their smartphones every day, and they use all these apps. They're in the Cloud.

"Then when they want to start to operate medical devices," and this is not only lab instruments, it's anything now, "So when they want to operate medical devices, they have to go back into the last century."

That was just so powerful because with that, I go

back to our organization, internally, and I tell them, "You have to remember..." Actually, at the recent leadership meeting I had a slide where I showed them a day in my life. We start maybe before breakfast or at breakfast.

I look at my smartphone, look at my emails and stuff and then I move on to a laptop perhaps for meetings and video conference. Then I move to a two, three screen desktop to do some hardcore work with PowerPoint and Excel.

Then towards the evening maybe I'm on my iPad to do some email again or social media. Then at night I have a projection TV so I pull down my screen, I project Netflix or Hulu. Some of the applications that I use, like Facebook or YouTube or email, lives on all of these screens. You have that same life, correct? I told them, "This is my life, a day in my life. Who has a similar life?" Everybody in the room raised their hand and said, "Yeah, my life is like that as well."

Then I told them, "Guess what? Your customers have the same life. They have the same expectation. They have the expectation that our software solutions are just as convenient to use and as flexible, when it comes to devices and screens and locations as your personal life." ♦

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Startups, Stat! How Johns Hopkins is Turning Doctors into Entrepreneurs

BY KELSEY ALPAIO, ASSISTANT EDITOR



Paul Nagy of the Technology Innovation Center at Johns Hopkins

You see a flashing light or hear a soft hum. Suddenly, you're filled with joy, anger, or fear. You're light-headed and confused.

Those are just a few of the “aura” symptoms that people with epilepsy can experience before having a seizure. Auras can help individuals by giving them time to find a safe place, contact a loved one, or—in the case of EpiWatch—log an oncoming seizure on their Apple Watch.

EpiWatch, a research project that helps track seizures, possible triggers, medications, and side effects using an Apple Watch app, is just one of the digital healthcare concepts that the Technology Innovation Center at Johns Hopkins helped develop in 2016.

The TIC is a design and software engineering team within the IT organization at Johns Hopkins Medicine, the Baltimore-based, \$8 billion health-care system. Johns Hopkins Medicine combines the expertise of the students, physicians, and scientists at Johns Hopkins University with the professionals and facilities of Johns Hopkins Hospital, which dates back to 1889, and is regularly ranked as one of the world's best. Within Johns Hopkins Medicine, the Technology Innovation Center serves as a hub for budding innovators, helping them build, deploy, and test clinical solutions for JHM.

The TIC's goal is connectedness—the team of around 27 is located just a block away from the main hospital. And just a few floors below the TIC is Johns Hopkins Technology Venture's FastForward startup incubator.

“I always found that there were too many degrees of separation between the people that create solutions and the people who then have to use them,” says Paul Nagy, TIC's deputy director. “The role of an innovation center is trying to reduce all those degrees of separation, so that we can have a quick way of evaluating a new technology and then really seeing if it actually improves clinical value... The people who are building the solutions are sitting right next to the physicians who are trying to deliver care to their patients.”

A 'DECENT CHANCE AT SUCCESS' FOR PHYSICIAN FOUNDERS

Nagy earned his PhD in Diagnostic Medical Physics from the Medical College of Wisconsin, working alongside physicians and imaging technologists in radiology and oncology.

“I was trained to be a partner with physicians to help them use technology,” says Nagy. “I grew up

trying to understand how they can use technology to improve patient care... I found that the ingredients for change are a combination of getting clinical leaders trained in leadership, and then pulling in technology and partnering with technology [experts] to evaluate it.”

These were the principles that guided Nagy as he helped to build the innovation center in 2014, along with Executive Director Dwight Raum. His goal was to create a function that would give physicians the opportunity to grow as leaders, work with engineering teams to find solutions, and ultimately test solutions in a clinical setting.

“I train physicians in systems thinking, design thinking, and how to be part of a team, so that I can give them an engineering team, and [they’ve] got a decent chance of success at developing a solution that can actually improve patient care,” says Nagy. “[The innovation center] is an extension of the IT organization. Most hospitals have very large IT organizations. I think they’re seen as infrastructure support, whether it’s desktop or networking or clinical information systems like the [electronic medical record.] We wanted to be an actual engineering arm alongside our IT group, to build new solutions. We often find that commercially, we only can get a certain percentage of the way to the solutions we’re looking for clinically. We built a team that can actually help us build custom solutions once we’ve already explored commercial opportunities, and we’ve explored the market, and we need to build things that we couldn’t find,” says Nagy.

Nagy says it took a couple of years for the center to get formally organized; his team was scattered across three different locations until mid-2017. But that doesn’t mean they weren’t delivering impact for the hospital and its patients. In 2016, the software developed by the TIC was used by Johns Hopkins providers to improve patient care in more than 2,598,401 different situations.

FINDING THE RIGHT IDEAS

Solutions designed in the TIC typically address problems brought to the center by Johns Hopkins clinicians. That happens in two ways.

The first way is fairly traditional. A clinician with a problem submits their proposal to the TIC, similar to how they might interact with an IT group or an outside software development company. But the TIC has a leg up on those alternatives.

The innovation center keeps project costs low by offering a subsidized rate for the work it does for colleagues within Johns Hopkins Medicine, and their familiarity with the institution aids in the

implementation of the solution once it’s ready.

The second method is a bit more involved: a clinician with a problem or idea submits an application to Hexcite, a four-month pre-accelerator program run by TIC.

Through workshops, leadership training, and team building, Hexcite’s goal is to provide clinicians with the resources they need to not only create a solution to their clinical problem, but potentially create a startup that will take it to market.

“We are clinician-led,” says Nagy. “One of the key tenets here is that we’re pulling solutions into the clinical space, not trying to push technology. It’s not technology looking for a problem. We start with a physician with a problem...and try to see how technology can help them.”

“I always found that there were too many degrees of separation between the people that create solutions and the people who then have to use them.”

PAUL NAGY, DEPUTY DIRECTOR, JOHNS HOPKINS MEDICINE TECHNOLOGY INNOVATION CENTER

Applicants to Hexcite pitch their ideas during a “Shark Tank”-style event, and the ideas with the most merit, potential impact, and feasibility are accepted into the program. Five clinical leaders participate in Hexcite each year. Once accepted, these clinicians must commit 20 percent of their time to the program, and pay a tuition of \$5,000, which is often covered by their department.

Successful startups share a few key factors, Nagy says. “One of them is the idea. One of them is the team. The other is the timing of the idea. We put a lot of energy into the team,” he says. In helping to build Hexcite teams, Nagy explains that the TIC also recruits business school, engineering, biomedical, computer science, and design students from the university to help the clinicians create their solutions and companies. “We focus on team performance, strengths, and integration... The physician is not going to become the CEO of the company. We want them to keep practicing medicine, but we want to build them a team and a company around their idea that could take their idea to the marketplace.”

Through Hexcite, clinicians are trained in “evidence-based entrepreneurship,” an approach developed by the author and professor Steve Blank. Teams conduct more than 40 customer interviews during their time in the program, and the clinicians are developed as “leaders” ready to implement their solution when the 16-week program is over.

“We don’t believe there are any technical solu-



tions,” says Nagy. “We believe they’re all social-technical solutions, which means that that requires adaptive leadership. Whenever we deploy a tool, generally that tool requires people to change their roles, or change their behaviors, or it requires a change in the clinical workflow, which can be very difficult... We also spend time training the clinical providers not just in how to build an engineering team, but in design and systems thinking and in how to have the adaptive leadership skills to be able to help influence their peers, and looking at this from a systems perspective... Part of this is really the physician leaders themselves working with their clinical and organizational leads as they deploy a solution to make sure that it has got good ownership within the clinical staff.”

But before TIC or Hexcite-made solutions can be implemented by the Johns Hopkins system, the question of funding must be answered. Funding for projects at the TIC tends to come from three places: operations, the capital budget, and external grants.

“We’re trying to partner with physicians,” says Nagy. “We want to train them in leadership and entrepreneurship. If you can’t get a \$100,000 grant from the state, the odds are good that you’re probably not going to be very successful with venture capital. There’s a way of beginning to learn how to pitch and learn how to raise funds [that are] part of the steps you need to do in company formation.”

FASTFORWARD

Nagy says the best next step for individuals who’ve been through Hexcite is to use FastForward, a collection of resources created by Johns Hopkins Technology Ventures to help companies move from prototype to marketplace. (The Technology Ventures

group is the licensing and commercialization arm of Johns Hopkins University.) One of FastForward’s “Innovation Hubs” is just an elevator ride away from the TIC, and a second is across the street. These spaces, which have a bustling, high-energy vibe, serve as coworking space and lab space for companies participating in FastForward. FastForward also hosts educational programming and workshops, such as an “Entrepreneurship Bootcamp” and “Startup Creation Series.” Megan Wahler, FastForward Program Manager, says FastForward startups can also access mentorship offerings, legal and accounting services, and assistance with investors. Wahler says the relationship between TIC and FastForward has existed ever since the former got started.

“We have had startups come through [FastForward] that have been developed from ideas that went to the TIC,” says Wahler.

“We’ve had some of our teams referred back to the TIC to do some development. [Our partnership] really came to fruition when we opened our second space and the TIC was temporarily displaced... They rented space [from us], and all of a sudden we became very close with a lot of people on the team, learning about what they did, and they learned what some of our startups were doing. It created this symbiotic, collaborative relationship.”

One startup that has used the resources of both TIC and FastForward was EDuMD, which created a web-based training platform called MileMarker. Wahler says the MileMarker project went through a development process with the TIC, which led to the formation of EDuMD as a company. After completing their time with TIC, FastForward helped EDuMD receive funding via the Maryland Innovation Initiative, and helped the company find their CEO.

EDuMD also participated in the first cohort of

FastForward, a startup incubator on the Johns Hopkins campus, offers shared and private lab space in one of their Baltimore-based “innovation hubs.”

FastForward's M1 Accelerator, a 16-week program for connected health and fitness companies. Hosted in one of FastForward's hubs, M1 companies receive \$25,000 in equity funding and support from Plank Industries, the University of Maryland, Brown Advisory, and the Abell Foundation.

"Johns Hopkins is a huge institution, and when Johns Hopkins Tech Ventures was reorganized three years ago, it used to be just a tech transfer office," says Wahler. "We're now focused more on commercialization and creating viable ventures. We made it one of our goals to work collaboratively with all departments and all of the different institutions within Johns Hopkins. We are sort of in the middle, and we're constantly working to find how we can help our many constituents and clients across each department, school, and institution. Part of our mission is also to promote the economic development of Baltimore and Maryland, so we realized that if we're working with each of the departments in our institutions, we also need to be working more collaboratively across the city and the state."

COMMUNICATION AND INTEGRATION

With resources like the TIC and FastForward, physicians at JHM have a multitude of ways to cultivate solutions to problems they encounter in the clinical setting. Nagy says that one rich problem set surrounds communication and collaboration.

"The ability for healthcare providers to collaborate with each other is a real challenge," Nagy explains. "Right now, the electronic medical record [involves] big documentation systems, and so they're not like Slack or instant messaging... If you're inside the hospital, there's many different care providers. There's lots of different hand-offs. There's a really strong need for collaboration."

He continues, "We don't typically use Skype inside healthcare. There's an enormous value for that, but that requires a lot of clinical workflow [changes]."

Nagy adds another major theme he's seeing in healthcare is patient engagement. He says physicians are often frustrated with the minimal interactions they have with their patients. There's a push for extending the relationship between office visits with wearable technology, telemedicine, or digital advising. This challenge is especially prevalent for patients with chronic illness.

But Nagy cites adoption of digital health solutions by both physicians and patients as one of the major challenges the TIC still needs to work on.

"You shouldn't even start a project in digital health unless you have a strategy for clinical integration," says Nagy. "If you're not going to be integrated into the electronic medical record, no matter how

good your tool is, there's no way physicians are going to be able to use it, because they're just way too busy.

The same thing should be thought of for patients as well. Right now, patient portals are their doorway into the medical records... We've actually built tools right off of our patient portal, and built apps that can integrate with it, so patients don't have to use a new password or have a separate account or have to manually enter in fields about what medications they're taking... People don't appreciate the value of integration. They think of a great idea, and they think people are going to jump through all these hoops to do it. People are incredibly busy, whether they're patients or providers."

That grounding in reality is essential, Nagy says, to getting innovation in healthcare to take hold. ♦

PITCH DAY AT HEXCITE

Just outside the glass doors, doctors hustled by, the tails of their white lab coats fanning out. Nurses in colorful scrubs clung to their clipboards, making beelines from one patient room to the next. But inside the Chevy Chase Auditorium at Johns Hopkins Hospital, there's a different sort of charge. Nervous energy was in the air on December 8, as the five teams from The Technology Innovation Center's 2017 Hexcite program prepared to give their final pitches. Each team delivered a 10-minute pitch to a panel of judges, including David Greenwald, Director of Business Development at Johns Hopkins Technology Ventures; Brett Jackson, Head of Strategy for Radiology at Philips; and Elizabeth Harber, Senior Program Officer at Abell Foundation, a Baltimore nonprofit focused on healthcare and community development. Here's a look at the companies that presented:

DAIWARE DaiWare is a mobile health application with the goal of helping physicians "forecast" a patient's health based on diet, exercise, circadian rhythms, and biometric information. The team is currently beta testing DaiWare, and creating a physician portal for the application, called "CompassRX." Targeted at hypertension patients, the application will collect patient-generated data and present it to the physician via an online portal.

WELBY Welby is an educational tool for patients, aimed at solving the problem of interpreting health information they may not understand. The tool includes a "decision support portal," electronic medical record data, patient stories, checklists, and more. This data is also laid out along a timeline, to help patients from diagnosis to recovery.

PROJECT COMMUNE Project Commune aids in communication between physicians by creating a "snapshot" of patient information based on the electronic medical record. This solution targets coordination around "episodes of care," or all of the services provided to a patient in a single visit. The platform brings this data together in real-time, providing all involved physicians with useful insights.

THERAMATE Theramate is a mobile health application design to monitor the mood, medication adherence, and treatment delivery for patients with both addiction and a mood disorder. This app aims to tackle the problem of disengaged patients who are at high risk for relapse and hospital admissions.

BARTLEBY Bartleby is an analytical tool used to improve clinical documentation, especially in regards to giving the correct "code assignments" for care provided to patients. Code assignments are used to identify diseases and care provided, which impacts reimbursement and supports physician decision-making. The tool uses machine learning to accurately document care, ensuring patient safety and cost-effective care.

What We Learned Running our Hospital's First Hackathon

BY LESLEY SOLOMON, CHIEF INNOVATION OFFICER, DANA-FARBER CANCER INSTITUTE AND FORMER INNOVATION DIRECTOR, BIOMEDICAL RESEARCH INSTITUTE AT BRIGHAM & WOMEN'S HOSPITAL



Lesley Solomon

Brigham and Women's Hospital, based in Boston, has always been a leader in healthcare innovation. But there has never been a focused center to support innovation efforts through resources, connections and advisory services. The Innovation Hub (iHub) was launched out of strategic planning work in which the hospital identified "innovation and discovery" as a key strategic initiative. After more than a year of planning, the iHub was officially launched at our first hackathon, over a weekend in September 2013.

We had no expectations, but we did have hopes of what might come out of it. We hoped that we might get a couple of good ideas, and start to create a more vibrant community among our clinicians and researchers, and entrepreneurs and scientists outside the hospital.

We asked people to focus on one of three themes:

1. The patient and family experience
2. Chronic disease management, outpatient
3. Modernizing evidence-based medicine

We kept it IP free—we didn't assert any claims of ownership over what was developed. Whatever you come up with at a hackathon is so early-stage, you don't really need to own the IP.

In terms of attendance, we knew we needed clinicians and also the MIT community. Zen Chu and his group, Hacking Medicine, brought the MIT community. Engaging clinicians who work here required some internal energy and communications before the event.

We had 150 people show up on the first full day, a Saturday. Some people were just curious, and some came from other hospitals, just to see what was going on. We only had space for about 120 people who were going to stay and work on projects. They came up with 54 ideas, and turned those into 17 different projects. Six of those won prizes. Our COO, Mairead Hickey, presented the awards at the judging. The fact that she was there impressed a lot of people, and it was good for her to see the energy and excitement.

Two of the 17 projects got into healthcare/tech accelerator programs. HermesIQ is at Techstars, and Twiage is at Blueprint Health. One project, Ring-leader is being formally supported by my group, iHub, to move it toward commercialization. They are developing a low cost wearable device that helps patients monitor heart health, and reduce hospital imaging-test costs for low-risk patients. They were the winner of the iHub prize, and the prize was for us to help move your idea forward. We have a call

with them every two weeks, we're making introductions, helping them think about IP, and helping them create a business model.

The biggest benefits for us were:

- Creating awareness of an innovation movement internally.
- Proving to leadership/skeptics that there was demand for this kind of work—demand for new ideas and the potential for commercialization of those ideas.
- Creating some initial momentum that has done wonders at bringing innovators together.
- Bringing people from the outside in who can contribute skills and knowledge other than what we have internally—engineers and clinicians and coders.
- Helping to enhance Brigham & Women's reputation as an innovator.

We're planning our second hackathon now. There are a few things we would do differently next time, in the interest of continually learning and improving.

- We had 3 different themes for the day. I think we would limit it to one theme or eliminate themes. People didn't really focus on them anyway.
- Mentors: We would have a point person who would connect with all of the mentors on site. (The mentors were experienced healthcare professionals, as well as people from the local business and venture capital community, who came in to advise and assist the teams.) That person would know about all the projects being worked on. And that person's role would be to connect the right mentors with the right teams.
- We had 1/3 clinicians, 1/3 developers/programmers, and 1/3 other (business, designers, etc.) We thought that was the right mix.
- We required all of the participants needed to be there for the entire weekend. That's hard for a more senior clinician with family/kids. I might open it up next time, and let clinicians pitch pain points and stick around to educate a team about the pain point, but allow them come in and out as needed. ♦

Hackathon staffers



Kaiser Permanente is Leveraging Digital Tools to Put the Consumer First

BY SCOTT KIRSNER, EDITOR



Tad Funahashi and Kris Dagger of Kaiser Permanente's innovation team

When it comes to renting movies, going shopping, or making bank deposits, Tad Funahashi observes that consumers have gotten used to apps and online services that eliminate hassles and waiting. Remember the Friday night Blockbuster run? Netflix nixed that errand.

But when it comes to getting seen by a doctor, it's as if the digital revolution never happened. Funahashi says that Kaiser Permanente, the non-profit healthcare delivery system based in Oakland, Calif., is working hard to change that. In a recent talk at the Chief Innovation Officer Summit, Funahashi explained how Kaiser is exploring the ways that video doctor's visits, diagnostic dashboards, and smart-phone photos can be used to reduce office visits and keep patients healthier, as well as how Kaiser is creating innovation funds and new partnerships.

Funahashi, an orthopedic surgeon and the Chief Innovation and Transformation Officer for Kaiser's southern California region, also discussed how Kaiser is trying to change a corporate culture built around the physician, rather than the patient. Instead of having Kaiser executives explain to MDs what ought to change, he says, "We need to get doctors to talk to doctors about how the practice may have to change."

The following text is an edited transcript of Funahashi's talk, titled, "Taking on Transformation."

...

ABOUT KAISER

We're a triad of three units—the health insurance plan, the hospitals, and the medical groups. All three of these sit under one umbrella, but are financially independent of each other.

In fact, the seven different medical groups negotiate yearly with the health plan to provide care for their members. There are over 38 hospitals, over 600 medical office buildings. We have about 18,000 physicians, about 50,000 nurses and over 180,000 employees in our system now. Our annual revenue is over \$56 billion. [There are] tons of innovations going on in [healthcare] and billions of dollars are being spent. Our role is to try to figure out which of these innovations are effective for our members and our patients. We're not in the area of innovating devices. We're not in the area of innovating in pharmaceutical agents. Although, we do work with pharmaceutical companies to [run trials] to see if they work.

Our job in this space is to check, try to figure out what works best. There was an interesting study done in Australia [on] new orthopedic implants. In Australia, they have a registry that tracks all of these implants. It turns out in this area, there's so much cutting-edge innovation. [But] some of the latest implants actually under-perform those that are standard.

CONSUMERISM IN OTHER FIELDS

I'm going to take you out of healthcare for one second and say, "What's happening in consumerism in other fields?" How many of you have ever gone to Blockbuster, or know what Blockbuster is? Or Tower Records? Or Borders bookstore? Great experience, top of their field.

At Blockbuster, you could figure out what the latest releases were, or your favorite genre of movies, or the classics. You could do the same at a bookstore and get that visceral, physical feeling of the shopping experience, and it was great.

What has happened to all of them? It wasn't as convenient as sitting on your lounge chair or in your bed, getting the movie delivered to wherever you were. In music, having it in your pocket, on your iPhone. Consumerism has changed. You never need to leave your home, never need to leave your couch, to get all of the modern conveniences that you need.

That's the level of convenience our consumers are looking for. Let me compare that for a moment with your healthcare experience. How many of you have gone to see a doctor in the last couple of years? What do you need to do? You have to take a half day off of your work. Make an appointment ahead of time, and then you come to my office.

There's an area in my office called the waiting room. What other business has a waiting room? Then you sit there with other angry patients that are sick and coughing on you. You're like, "I hope I don't get sick." Then we bring you into my exam room. We undress you, so you can sit on that paper sheet. You're cold and uncomfortable in there. You wait for me to come in, so I can give you this 15 to 20 minutes of miraculous cure that I have for you.

You think about that, and you go, "Would that work in any other business?" Would it? Imagine if that was your bank. There was a waiting room in your bank. You're holding your check, and you're waiting to deposit it. You don't know when the teller is going to call you up. Would you stay with that bank? No.

The banking industry [lets you] deposit a check on your smartphone device. If you can do that with

HISTORY

Kaiser Permanente was founded in 1945. It is one of the nation's largest not-for-profit health plans serving 10.5 million members. It comprises of:

- Kaiser Foundation Hospitals
- Kaiser Foundation Health Plan
- Permanente Medical Groups

Hospitals: 38
Medical Offices: 619
Physicians: 17,791

Nurses: 49,778
Employees: 177,445
Annual Revenue: \$56.4 billion (2014)

PHYSICIAN CENTERED CARE

MD CULTURE (18K KP MDs)

800K USA MDs (FORGED MD CULTURE)

NO CHANGE

NEVER-EVENTS =

NO ERRORS

SAFETY

NO MISTAKES

DOGMA

98% A+

FELLOWSHIP

RESIDENCY

INTERNSHIP

MED SCHOOL

PRE MED

KP APPROACH TO CHANGING THE MD CULTURE

MD CULTURE 9,000 MD'S

EXECUTIVE SPONSORSHIP

MARKET FORCES

20:20 INNOVATION CHALLENGE

RAD CULTIVATE

Fund PRODUCTION FUND FOR TECHNOLOGY

INNOVATION STUDIOS

HEALTH INNOVATION

Center for Total Health

Garfield Center

Innovation Studio

a bank, [why can't you] have similar experiences in health care? We at Kaiser Permanente question that.

WHY CHANGE IS DIFFICULT FOR DOCS

Is it because consumers don't want it at health care? If it's not the consumer, what's the main roadblock? Why has healthcare...not changed at all over the course of the last hundred years? It's actually similar to higher education. Professors don't really want to change. Engineers don't really want to change and frankly, doctors...don't really want to change.

Partly it has to do with our comfort level. It has to do with the regulations that we're under. Also, it has to do with the policy and the fee structures that we're under. If the only way that I get paid is for you to come and see me in my office, that's the only way I can see you in my office. They say if you ever make a mistake [as a doctor], it's actually called a never-event. An infection, a [deep-vein thrombosis], anything that isn't exactly perfect is called a never-event.

[As a doctor,] you are going to want to do the same thing that you're very comfortable [with,] where you know your outcomes... This whole culture is extremely difficult to break. If you think about what's happening in the market, the healthcare market has dramatically shifted. The Accountable Care Act has clearly been a factor in that. There is an aging population in the United States. There are decreasing resources. [Healthcare spending is] at almost 20 percent of our gross domestic product.

We have to begin at the top. Our executive sponsorship says we're going to need to change. They see what's going on in the market forces. [But] nothing in healthcare will move without physicians moving. How do you get physicians to move, in addition to executive sponsorship? Those of you who work with engineers, how do you get engineers to move? You don't [put] an administrator in front of a bunch of engineers... No, you get engineers to talk to engineers, and likewise, we need to get doctors to talk to doctors about how the practice may have to change.

We have a doctor from every medical center who's an innovation champion. They have a group at each of their medical centers. This group gets together once a month to talk about innovation.

What if we got rid of waiting rooms? I don't think patients really like waiting rooms. Our future medical office building design eliminates waiting rooms and changes them into interactive areas where patients can get engaged with their care immediately. There could be other forms of examination, be it by telephone, or by another tool.

We support innovation funds. We now have three innovation studios in Washington, D.C., another one in northern California, and another one in southern California where we can demonstrate, foster, and nurture innovations.

USING THE SMARTPHONE AS A DIAGNOSTIC DEVICE

As an example of some of the work that we're doing, let me go over some of the projects that are beginning to change the way we practice. Why not begin to leverage the smartphone for your health a little bit more? If you have a rash, do you have to physically take yourself to go have somebody look at it? They don't usually touch it.

That's the way you learn how to [diagnose rashes, from textbooks]. Why now that once you're in practice, you have a patient come and see you? In part, because that's the only way we get reimbursed.

What if that wasn't an issue? Could we provide that service for you over the smartphone? We're testing that in San Diego currently, where a smartphone app instructs you how to take a picture of that body part, the lighting. Once done, it asks you some questions about your rash. All the same questions that the doctor would ask you if you were face-to-face.

It sends the picture and a synopsis to the doctor. We're checking to see how many times the doctor can make an accurate diagnosis. You can still come in if you need to have them come in. But wouldn't it be much more convenient to have that taken care of without ever coming in, with a smartphone?

VIDEO VISITS

[At Kaiser, we] developed this tool called integrated video visits. These video visits are delivered through that electronic medical record system that I just talked about. It's available on the flagship app, on kp.org. You can now get ahold of doctors and have a video appointment. More convenient for patients? We think so. Is it a complete replacement for face-to-face? Probably not, but it gets us a little bit closer to delivering care where you are, at your convenience as opposed to our convenience.

A WELLNESS DASHBOARD

When you start your car every morning, what happens? It starts, but in addition to that, a bunch of lights go off on your dashboard. If one light stays on, like the engine light or the oil light, that tells you that your car is not in perfect health. You should

go see the car doctor. Banks...give you a statement of how your accounts are doing. Investment firms do the same thing. Where do you go to see how you're doing in terms of your health? Do you have a dashboard, where ... [it] says, "You're in good health," or, "You're forgetting some of your preventative care things"? We think that's a mistake. Patients should also be as actively involved in their care, by having something like a dashboard. Again, both on the flagship app and on kp.org, there's something called the Online Personal Action Plan.

When you log into that, it tells you if you need a mammogram, a pap smear, or a PSA. It tells you, "You should go get that done." If you have a chronic illness, it tells you about your drugs and what your labs should look like or when you need to get labs.

If you're completely healthy, if you put in your weight, your height, it tells you if you're overweight and it tells you how to go about losing weight. [It's] a dashboard for health that's available for you wherever you are. Where are we trying to get to? Ultimately it's about providing care, anytime, anywhere, in the manner that you want it. Much like Amazon has been able to do with many products.

DOING MORE WITH LESS

[If we improve the health of our members, we] don't have to build as many buildings and have [as much] infrastructure to deliver care. Look at Target— Target has a retail operation that makes about \$75 billion in revenue a year. They do that with what? 1,800 stores, about 60 warehouses. Amazon does about \$80 billion worth of business out of about 80 warehouses [and no stores.] A huge difference in infrastructure costs. Can we apply some of that to healthcare and improve the cost of healthcare, and the quality of healthcare at the same time?

How are we going to do this? We are a health-care institution. ...We are seeking opportunities [by] meeting [with] digital [companies] and other efficient companies. We're also working with other companies, from artificial intelligence, to big data analytics, to data visualization. All areas that will begin to transform healthcare...

I've been in practice now for almost 30 years. I'll tell you, you look forward to the next five years. The transformation that we could do in healthcare, the way we look at health delivery—that could be as revolutionary as the digital transformation, as revolutionary as a smartphone. Everybody has a smartphone. What a change that's been to our lives... Shouldn't we have that degree of change in health-care, to deliver healthier communities? ♦

VIRTUAL DERMATOLOGY (VDERM)

· HEALTH ·
INNOVATION

KAISER PERMANENTE

Integrated video visits (ivv)

Mobile devices or desktop computers can be used to conduct a video visit with a clinician

Vidyo



ADVICE FROM OUR SPONSOR, NASON GROUP

The Role of Humanization in Disruption: Debunking Three Critical Myths



SHAWN NASON
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Humanization plays a significant role in disruption. By adopting a human-centered, people-first mindset, organizations can transform how they do business and make a significant impact in the marketplace. However, there are a lot of myths embedded in the conversation about humanization. Here are three that deserve debunking.

THE MYTH OF THE BOTTOM LINE

Imagine that you are a mother, a wife, and a nurse—and you have cancer. You're on your way to yet another medical appointment, which is now a normal part of your weekly schedule. You walk into the doctor's office and, without looking up, the receptionist greets you by simply saying, "Oh yes. You're leukemia." At that moment, you realize you aren't a mother in their eyes, or a wife, or a nurse. You're not even a human. You are now cancer.

This happened to a dear friend of mine seventeen years ago. Though she is now cancer free, she gets a lump in her throat when she recounts this story. It was the moment she realized that it's possible to feel non-human.

Why is it so easy to lose sight of the simple fact that we are all human? No matter the size of the organization, there's a constant pressure to increase profit. If not kept in check, that can lead to de-humanizing the company and the consumer experience. Associates and consumers become just another cog in a machine as we disregard their emotions, motivations, and needs. Instead of focusing on their humanity, we focus on the bottom line.

The irony here is that, by humanizing our associates and consumers, we can actually increase the bottom line. The two don't need to be mutually exclusive.

When we humanize our associates by investing in their physical, emotional, and spiritual well-being, we're empowering them to create a better consumer experience that will enable growth in our companies. When we humanize our consumers, we are better able to understand their needs, which will enable us to create a better product or service.

When you shift from being profit-focused to being people-focused, a whole new world for potential profit opens up. How can you disrupt by humanizing your approach to business?

THE MYTH OF THE EXPERT

I recently worked with a healthcare provider who presented a bulleted list of solutions to the company's current struggles. The list was written beautifully, and it was obvious that she had put a lot of thought into it. But it soon became clear that her solutions may or may not be what the customers

wanted or needed. Luckily, we had time to go walk around the clinic together. As we walked through the waiting rooms and treatment areas, we talked with patients, their families, and their care providers. We asked about what they would do if they could reinvent the patient experience. Because some of the patients were children, we walked around on our knees to gain a child's perspective. We heard new perspectives and saw things differently. After this human-centered experience, I asked our partner to reflect on their experience. Her response? "I can't believe I've never done this before. I will never approach our clinic the same way again!"

It's easy to get lulled into believing that we know the best answer. After all, we earned the right to be sitting in the position that we're in, right? And, we hired an expert team to back us up. What could go wrong? Well, quite a bit actually.

Yes, you are an expert in your field and you are in your position for a reason. But the only way to keep up with the needs of the humans who are your associates and consumers is to walk a day in their shoes and talk with them. Without their voices in the conversation, it's easy to move in the wrong direction—one that will eventually cost you valuable time and money.

Fully embracing the human-centered decision-making process means always including the right voices in the conversation. This means always having an associate at the table when making a decision that affects associates, and always having a consumer at the table when making a decision that affects them.

When's the last time you did an empathy walk to move through your company's associate or consumer's experience? As with the healthcare provider in the story above, it's worth your time.

THE MYTH OF STATUS QUO

Ten years ago, a friend of mine sat at her kitchen table filled with frustrations about the way pediatric cancer patients were being cared for in her community. She knew there was a better way to treat patients and their families and, taking enormous financial risks, set out to make her vision a reality.

She ended up creating a foundation called Cure 4 the Kids that operates two clinics that are changing the way healthcare is provided. In their first decade of operation, they have now served

over 40,000 people. Among her bold statements about Cure 4 the Kids, she claims things like, "The price of poverty shouldn't be death for a child." And, "Even the journey from diagnosis to the unknown can be an extraordinary experience." She has committed to opening research projects for every patient who comes into her clinics, even if that type of cancer is only affecting one child. She does this because, she explains, "that one child is someone's child who deserves to live!"

We often know that there is a better way to do

“When we humanize our associates by investing in their physical, emotional, and spiritual well-being, we’re empowering them to create a better consumer experience that will enable growth in our companies. When we humanize our consumers, we are better able to understand their needs, which will enable us to create a better product or service.”

SHAWN NASON, FOUNDER & CEO, NASON GROUP

something, but the hassles and risks involved can often feel like they are not worth it. It's much easier to stick with the status quo and keep on doing what we're doing. After all, our bottom line is doing fine, and things are running smoothly.

With the winds of disruption blowing through today's marketplace, it's dangerous to believe in the status quo. Those who are not focused on changes large and small are at risk for being disrupted. In fact, we tell our clients that you can either be a disruptor or be disrupted, but there's no such thing as sitting on the fence and watching.

As in the case of Cure 4 the Kids, being a disruptive force involves risk. But to move your company forward into the world of disruption, you can't let these risks scare you into being OK with your current norm. Though this feels like the safe move, the reality is that someone else—someone who isn't afraid of change—is ready to disrupt you.

Instead of believing the myth of "status quo," position yourself on the cutting edge of disruption by focusing on the humans that you work with and work for.

Listen to their needs, understand them as people, and embrace their ideas. When you focus on humanizing your company and your consumers, you minimize the risks that often scare companies into sticking with the status quo. ♦

Putting Emerging Tech to the Test in a 12,000-Employee Hospital System

BY SCOTT KIRSNER, EDITOR



John Halamka, Chief Information Officer, Beth Israel Deaconess Medical Center

John Halamka is the very model of an early technology adopter. Blockchain, augmented reality, precision medicine, machine learning, digital identity, and credentialing—Halamka has tested its applications in healthcare and has an opinion. “My life has been devoted to the pursuit of innovation—attempting to embrace new ideas and new technologies before the path ahead is completely clear,” he writes on his blog, “Life as a Healthcare CIO” (founded way back in 2007.)

Halamka is not only Chief Information Officer for Boston’s Beth Israel Deaconess Medical Center, he is also the Dean for Technology at Harvard Medical School, Chair of the US Healthcare Information Technology Standards Panel, and a practicing emergency physician. Beth Israel serves 3,000 doctors, 12,000 employees, and one million patients a year.

We spoke with him in March 2018 about his advice on bringing new technologies into a large healthcare organization—and some of the projects he has worked on recently with Amazon and Google.

...

FROM DISSEMINATION TO DIFFUSION

What you see so often in healthcare is announcements of pilots, where three people try something for a day, and it never goes anywhere. Then someone claims victory. That’s just silly.

The real measure of success is adoption. The February issue of the journal *Health Affairs* is devoted entirely to innovation, and it includes an article on dissemination versus diffusion. Dissemination is when I try something with blockchain, go to the HIMMS conference, and talk about it. Diffusion is when every doctor’s office—even the two doctor practice in North Dakota—is using it.

So how do you get from a pilot to dissemination to diffusion?

Having a secret skunkworks outside of production and operations never, ever works. The cool guys in the skunkworks say, “We’ve got a flying car!” And everyone in the salt mines says, “We’re on old skateboards here.”

So we’ve tried to embed innovation in operations. It’s similar to Google’s idea of 20 percent [time for employees to work on their own projects.] You have this total alignment of business owner demand with innovation. It’s not IT trying something, like a 3D, holographic iPad. It’s because a business owner says, “We have a crisis right now—bed capacity, quality, readmissions—and then IT says, “I see that

crisis, and I have an idea. Let's try that idea and see if it helps your crisis." Then if it does, the business owner says, "Let's drive it everywhere."

At Beth Israel Deaconess, our most expensive real estate is the OR. It's \$100-a-minute to keep it going. They're expensive to build and maintain. The crisis the business owner had was that demand exceeds supply. And they said, "What can you do?"

We said, "How do you allocate OR time?" And they said [they allocate two hours for an appendectomy, whether it is being done by] an intern versus Dr. Famous, and whether the patient is an 18-year old or an 80-year old. We said, "Let's have Amazon study our last two million operations. We'll feed it three variables: who was the patient, who was the doctor, and what was the procedure?"

Beth Israel Deaconess has maybe 500 people who operate. So we started with 25, and said, "What if we simply re-do the schedule of 25 surgeons, and Amazon does it rather than a human? We were able to create 30 percent increased capacity in the OR." That's because you're given 25 minutes, [rather than two hours,] for an 18-year old patient [being operated on by] Dr. Famous, who has done thousands of these procedures.

As a result, the administration says, "You've been able to free up 30 percent of OR capacity for 25 doctors. Let's roll that out to 500, tomorrow." The roll-out to everybody is happening now, and we have had the 25 have been in full production for about six months.

A PILOT THAT DIDN'T FLY

[We ran a pilot test with Google Glass in 2014, which involved about 20 doctors.] Google Glass is the worst engineered device ever. It's the Edsel of IT innovation. [At the outset, we] said, "We believe the idea of a wearable technology is inherently good. Emergency physicians just have a hard time doing CPR while holding an iPad. [So] we went into production with Google Glass for emergency physicians. We told the patients we were doing a trial, and [the devices we used] were orange, so the patient could see it. We had incredible doctor satisfaction, getting hands-free [access to] patient data, and incredible patient satisfaction. Instead of sitting and staring at a keyboard, the doctor was staring at you.

It failed for three reasons. The battery life [of the Glass headsets] was an hour and a half, but doctors in the ER work an 8- or a 12-hour shift. So were you supposed to carry a car battery on your back?

Problem two is it used a Texas Instruments processor so underpowered that as soon as you tried to push it to do something, like voice capture [of a doc-

tor's dictation], it overheated and melted the plastic. We had Glasses melting on physicians' faces.

The third was the TI processor was so old, there were no Android updates available for it. [That is especially important] around security. It was a medical device with no patching available.

We would have used it in a continuous way in full production if the engineering of the device had been sound. We do look forward to somebody—maybe not Google—creating that next-gen version of a wearable camera, voice control, and network connectivity which has 12-hour battery life and fully secure. As soon as we get that, we'll try again.

We're fine with failing, but we want to fail because technology isn't ready for prime time—not because of change management or budget issues.

BUYING TIME FROM COLLABORATORS

How did we learn not to use a skunkworks approach? What we found in the past is that you get shadow IT. Shadow IT means it's not coordinated, and it doesn't have the rigor of controls and evaluation and prioritization. In my 30s, I was the rogue. In the 1990s, I ran a skunkworks called the Center for Quality and Value. It was meant to be this really edgy, innovative place. But even if you innovated, it was hard to sustain those innovations, because they weren't part of the fabric of the day-to-day operations.

“Having a secret skunkworks outside of production and operations never, ever works. The cool guys in the skunkworks say, ‘We’ve got a flying car!’ And everyone in the salt mines says, ‘We’re on old skateboards here.’”

JOHN HALAMKA, CIO, BETH ISRAEL DEACONESS MEDICAL CENTER

Today, inside my organization, the IT organization, we have the Center for IT Exploration. It has two full-time people, but then [also collaborates with] about twenty part-time people [around the company.] Those twenty part-timers, some of them are in tech, but a number of them are clinicians who code, and can do interesting data analytics or machine learning activities.

If you carve out a protected day or two a week [for those part-time people] to work on innovation projects—and if it's a meritocracy—people tend to put in nights, weekends, and free time, because [the work is] so exciting.

[We don't ask the part-timers to volunteer their time, though.] I buy doctors' time. [Do I have a vast

budget to do that?] My budget is 1.9 percent of the budget of the organization. So I go out and seek donations. We're a nonprofit; I'll go out to our trustees or people in industry and say, "Would you contribute \$100,000 to fund a series of innovations that are going to improve patient experience?" Increasingly, in the innovation economy, fundraising from non-traditional sources is part of the job.

I open source pretty much everything we do. It's available free to anyone.

GOVERNANCE MATTERS

Governance is unbelievably important. If every time there's a new bright shiny object, people say "Squirrel!" and chase it, you'll wind up with a cloud-hosted blockchain with machine learning for APIs. There has to be a process where you bring stakeholders together, and say, "What should we do?" There are always a million things you could do, but what is the highest priority? What are our metrics for success? If we're going to fail, how do we fail fast? You've got limited time and resources.

MACHINE LEARNING APPLICATIONS

I have five Amazon employees in my organization, and we have twelve Amazon machine learning apps in production, and 36 in the pipeline...

Amazon is looking for the opportunities in healthcare. And unlike IBM Watson replacing doctors—not—Amazon is saying there's a bunch of prosaic stuff that goes on every day that could benefit from cloud-hosted utilities. What is the most common technology in a doctor's office today? A fax machine. If you were to have a surgery at Beth Israel Deaconess, how do we get your surgical consent? Your doctor faxes it to us.

We built a machine learning service to read faxes. Our faxes are read by Amazon's [machine learning service.] Amazon says, "Oh, this is a surgical consent. Let me insert it into his record as a digital document, and check the box that surgery can begin." [You can also apply machine learning to questions

like, which patient] is going to need the ICU, and who is going to be discharged when?

My chairman of radiology told me that when he was a fellow, he was reading MRIs that had 20 images. Today, they have 300 images. Can a mere human look at 300 pictures in a single case and be able to find the needle in the haystack? It's just hard. But what if you had a machine learning algorithm that said, "I've sifted through the 300, and here's 20 the human should look at?" He told me that that would bring the joy back to practicing for him.

ACCEPTING REASONABLE RISK

Maybe there's a point where you're an early adopter, and it's kind of risky. I think if you want to be an innovator, you have to have some tolerance of reasonable risk. If you wait until all the risk goes away, it's too late.

[When I tell people that] all my production systems run on Amazon Web Services, [they say,] "How could you do that?" My answer is, "How many employees does Amazon have paying attention to resiliency and security?" I have five. They have more.

WHAT'S THE CATALYST FOR INNOVATION?

You do need a catalyst [to make innovation happen in a large healthcare organization,] whether it's a frustration or problem or economic urgency. I've certainly heard lots of pitches where what is being pitched is a solution in search of a problem.

You're trying to connect your FitBit to Twitter to create a social network for weight loss? That [is likely] innovation for innovation's sake. There's no urgency.

[In the past decade or so,] our urgency was driven by regulatory compliance: HIPAA, the Affordable Care Act, meaningful use. Those all happened simultaneously. ... Today, our urgency is about the business imperatives; it's not the federal government telling us what we should work on next. It's how do we survive changes in market conditions or reimbursement. ♦

So You're Trying to Innovate in a Heavily Regulated Industry...

BY NAOMI FRIED, INNOVATION & DIGITAL HEALTHCARE LEADER;
CONTRIBUTING COLUMNIST



Naomi Fried, former
Chief Innovation Officer
at Boston Children's
Hospital

Several years ago, my innovation team at Boston Children's Hospital came up with the idea that our doctors could provide care virtually, via videoconferencing, to critically-ill patients in small community hospitals. We brought this idea to the legal department, where it was met with scowls and deep skepticism. Our lawyers were worried about patient consent, physician licensure, medical liability... the list of legal and regulatory concerns they had around this innovation in care delivery went on. And on. And on!

But after many conversation and much hard work, we ultimately launched our "Teleconnect" program to help critically-ill kids in other hospitals. Our legal team provided invaluable guidance and advice. Ultimately, they even became internal advocates for the Teleconnect program.

The importance of innovation is widely accepted. Every company must innovate to survive and thrive, and to avoid being overtaken by peer companies—and upstart firms—that are themselves eager to gain a competitive advantage.

But engaging in actual innovation is far from easy. There is experimentation, testing, tinkering and—sometimes—significant risk-taking. Often, the outcome is failure. In short, innovation with its risk of failure is SCARY.

In industries that are heavily regulated—such as pharma, healthcare, insurance, and banking—there are additional barriers to innovation. Legal, compliance, and regulatory requirements can loom large, and have the potential to stifle innovation—if you don't address them head-on.

Nevertheless, innovation can thrive in large organizations in heavily regulated industries. I know. I have been working on innovation in regulated industries for over a decade now. I have facilitated innovation within health plans, hospitals, and biopharma companies.

Here are seven tips to navigating the internal legal and regulatory roadblocks to innovation that you often encounter in these kinds of organizations.

...

1. BUILD RELATIONSHIPS PROACTIVELY WITH INTERNAL REGULATORY AND LEGAL FOLKS

That's right. Seek out—don't avoid—the staff responsible for legal, regulatory, and compliance within your organization. Innovators sometimes think they are better off steering clear of these gate-

keepers and guardians for as long as possible. That is a mistake; you can't avoid working with these folks. If you don't find them, they will still find you!

Don't wait until your innovation is "ready" to talk to your regulatory colleagues. Rather, invite the legal, regulatory, and compliance folks into early conversations about innovation.

It's best to discuss your innovation project when the stakes are still low, at the beginning of the innovation lifecycle. Give them time to digest the new idea. Let them provide input and guidance in the early stages, at a time when you are still able to shape and mold the innovation.

I found the regular monthly meetings we set up with our legal team at Boston Children's Hospital gave us the time and space to discuss issues that were emerging around the deployment of our "Teleconnect" videoconferencing innovation. Because we discussed our plans well in advance, these meetings were calm and collaborative. While it's great to have informal check-ins, nothing beats regularly scheduled meetings for making sure legal and regulatory partners are up-to-speed and on board with plans.

Also, regulatory folks are less defensive and more open in the planning stages than after considerable resources have been invested in the innovation. Don't wait until the idea is fully baked or tested to share it with legal and regulatory.

What if you still encounter resistance? Is it time to go over the heads of the lawyers, pull rank, and bring the CEO in? Sure, this approach can quickly break through an impasse. But I would not recommend it in an organization where you are trying to repeatedly innovate over time. This type of maneuver is likely to alienate your legal partners and make it harder, not easier, the next time you seek their support or approval.

In discussions with the legal and regulatory folks, it is important to continuously reference the importance to the business of the innovation. Remind them that shutting it down or blocking it is not an option because it is bad for business. That will keep the lawyers at the table, and keep them focused on finding ways to drive the innovation forward.

2. FIND A CHAMPION WITHIN YOUR LEGAL AND REGULATORY DEPARTMENTS WHO IS INTERESTED IN INNOVATION

Find an innovation partner—someone you can work with throughout the project (and perhaps eventually on multiple projects over time.) This internal innovation partner can help you navigate not just your organization, but also the industry. Having a

legal or regulatory innovation champion also lends internal credibility to your project.

Wondering where to find this legal or regulatory innovation ambassador? Be open to an innovation partner from any of your organization's legal or regulatory groups. Your legal innovation champion could be a seasoned lawyer, or a more junior attorney who is interested in innovation.

At a biotech company I worked at, my regulatory champion on a social media initiative turned out not to be someone who was assigned to this domain, but rather a relatively new lawyer. He had recently joined the company and was thoughtful, caring, and interested in exploring the possibilities of social media. He was willing to work with us and serve as our champion, creating a bridge back to other regulatory experts in the organization.

3. REFRAME THE CONVERSATIONS

The easiest and safest thing for legal and regulatory folks to say when confronted with innovation is "no." To avoid a conversation that ends in "no," try to reframe the discussion. Get your legal partners to speak in terms of "yes, but." That is, "yes, you can try that idea, but here are the restrictions." Or perhaps they can provide a "yes, with" answer. "Yes, you can innovate but with certain constraints." These "yes, but" and "yes, with" conversations provide space for exploration and potential for innovation—unlike instant "no's." Reframing can be done by asking

“What if you still encounter resistance? Is it time to go over the heads of the lawyers, pull rank, and bring the CEO in? I would not recommend it in an organization where you are trying to repeatedly innovate over time.”

NAOMI FRIED, FORMER CHIEF INNOVATION OFFICER, BOSTON CHILDREN'S HOSPITAL

questions and exploring hypothetical scenarios.

At Boston Children's Hospital, when we began planning our first hackathon, the question of who would own the intellectual property that was generated came up as planning for the hackathon progressed.

The initial response from our lawyers was that the innovators could not own any IP developed at our hospital-sponsored hackathon. But over the course of a series of discussions, we were able to reframe the conversation. Ultimately, everyone agreed on a mechanism for sharing IP between the hospital and the innovators (outside entrepreneurs, inventors or designers, for instance.)

4. RECOGNIZE FOLK LAW

In regulated industries, there are certainly rules that need to be followed and laws to be aware of. However, there are also often grey areas—where the law is not clear. Innovation frequently occurs in uncharted territory, where regulations may not be well defined. Often in the absence of clear laws and regulations, people rely on “folk law.” Folk law is not real law. Rather it is the way things have always been done, or the assumptions people have always made — and thus is treated by some as if it were a real regulatory constraint. Folk law develops as a result of what people are familiar with and comfortable doing. Once restrictions are identified as “folk law,” it becomes easier to move past them.

At a biotech company where I worked, our legal team was initially uncomfortable with executives tweeting. But once we began to discuss the source of their discomfort, it became clear that the concern was rooted in the fact that none of the executives had ever been active on Twitter. The “folk law” that “executives can’t tweet” crumbled once it was identified. Soon after, the regulatory team issued a set of internal policies and guidelines around the use of Twitter by employees.

5. TRACK THE COMPETITION

Legal and regulatory folks are not always comfortable having their organization be the first to innovate and chart new territory. However, when other organizations in the same industry are innovating and pushing the envelope, in-house legal and regulatory experts become more comfortable with their organization doing the same.

There is a sense of “safety in numbers.” Tracking how your competition is innovating can help you make the case for innovation with your internal legal and regulatory experts.

6. COMMUNICATE BROADLY

Strong internal communication is always important when innovating. Effective, broad communication across the organization is even more vital when innovating in a heavily-regulated industry. Why? In regulated industries, other folks in the organization besides the legal and regulatory experts may also worry about innovation-related risk. Developing a broad communication plan that reaches all areas of the organization and keeps folks regularly updated can make the difference in overcoming internal resistance to innovation.

When I was Chief Innovation Officer at Boston

Children’s Hospital, we had monthly forums where we shared updates on our innovation programs. I continuously made rounds to all the clinical departments at Boston Children’s to provide updates and information to the doctors and nurses there. And we produced an annual innovation report that proved a great way to disseminate information about our progress on a yearly basis.

7. BE PATIENT

Innovation in a regulated industry takes more time than it does in other industries. There will often be folks who are uncomfortable with innovation and may raise red flags. But just because you are in a regulated industry doesn’t mean that you can’t innovate successfully. Just be patient. Celebrate progress as you make it. Focus on the ultimate goal of your innovation, and don’t get discouraged when there are setbacks. (I’ve been there!) What doesn’t work is treating legal, regulatory, and compliance folks as the enemies of innovation. In fact, they can be great enablers.

No one said it’d be easy, but with time and patience, and by following the steps above, you can bring innovation to a highly-regulated industry. ♦

Naomi Fried has held senior innovation and technology roles at Biogen, Boston Children’s Hospital, and Kaiser Permanente.

Boston Children’s
Hospital



Insurance

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Achieving Innovation Balance: Advice from Cambia Health's Chief Innovation Officer

BY MOHAN NAIR, SVP AND CHIEF INNOVATION OFFICER, CAMBIA HEALTH SOLUTIONS, CONTRIBUTING COLUMNIST



Mohan Nair, Chief Innovation Officer, Cambia Health Solutions

In the five years since founding our innovation team at Cambia Health Solutions, a non-profit family of healthcare businesses, we've built five companies from employee ideas; have engaged more than 29 percent of employees in innovation activities; and have begun looking at co-innovation and co-creation across industries. Perhaps most importantly, we've worked hard to establish a cutting-edge culture: 84 percent of our employees believe that Cambia encourages innovation.

But these successes do not mean we are successful...at least not yet. Getting to this point has meant constantly maintaining a delicate balance of activities, focus, and relationships—something to which most Innovation Leader members can relate, I'm sure. Here are some of the lessons we've learned along the way:

1. BALANCE STARMAKING WITH TALENT SPOTLIGHTING

Conventional wisdom has always been, "Put a spotlight on your intrapreneurs." As you shine a light on employees' innovation activities, you can eliminate barriers and normalize innovation activity for the rest. We've done that well at Cambia. For example, we highlighted at every turn the efforts of one particular corporate entrepreneur, who came to us with an idea that turned into a disruptive product and company.

But in promoting a single leader's efforts to create something transformational, we missed countless opportunities to promote those pursuing and acting on smaller innovation opportunities within their everyday jobs—arguably a more attainable goal for the majority of employees. By focusing closely on a single entrepreneur, we actually missed some opportunities to democratize innovation, and might have created an unattainable expectation for others. Here's how you can do it differently:

- **Highlight small innovations:** Your innovation team has tremendous power in promoting your corporate intrapreneurs. Don't exclusively shine the spotlight on a few. Instead, use your starmaking ability to spread the word about "micro" innovators as much as you do the "macro" innovators.
- **Promotional ownership:** Give someone on your team the specific responsibility for internal marketing, tied to your corporation's internal communications function, and engage your whole team to look for and support



promotional activities.

- **Set a baseline:** Aim to promote a certain number (i.e., 20) of different employees each year in depth. With that, you turn innovation activities—even small process improvements—into your standards of operations.

2. UNDERSTAND THE PROFILE OF YOUR INTRAPRENEURS

Employees participate in corporate entrepreneurship activities for a variety of reasons—you'll see newly-minted MBAs looking to make a mark, and soon-to-be-fired employees looking to salvage their careers.

Hopefully, a significant number of your participants are top performers who are earnestly trying to improve the company and grow in their positions. In that sense, engagement in innovation can be a mechanism for creating an informal network of your high performers.

But it can also be a mechanism for understanding your workforce and your hidden management challenges, thereby improving the odds of innovation success.

For example, we came to understand that some employees were sharing their ideas with us because of barriers they faced in other parts of the organization. They were certainly leveraging our crowdsourc-

ing platform appropriately, but it became apparent that there were other underlying management issues we needed to address. This has been invaluable in understanding where the allies—and obstacles—of innovation exist in the organization.

Similarly, it became apparent that some employees were sharing ideas in an effort to hide existing performance issues, or to spend less time on their core job function. Others submitted ideas out of a misguided pursuit of fame or fortune, and—as a result—were rarely open to the advice of others when it came time to refine or improve their ideas. Over time, we found that engaging with either of these types of employees can be problematic; in fact, we discovered that lack of humility is more dangerous than lack of skill or ability.

The more data you have to understand the profile of those who engage with you, the more you will understand how to tailor your approach. For us, it meant a vetting process in our initial engagement, and a coaching system for working with employees. This is where we were able to investigate true intent and ability, and determine how we should engage moving forward.

3. OPERATIONALIZE THROUGH “SERVANT LEADERSHIP”

As I know Innovation Leader has covered extensive-

A timeline for a specific challenge posed to Cambia employees.

ly, a productive working relationship with the business units has been a major challenge for many innovation teams and programs. Some people on the operational sides of the business may either resist your efforts to work with them, or feel threatened. This is normal. An organization is an organism, after all, and the operational arm of a company must, like a skeletal system, be strong and rigid enough to deliver on the core business offering. Its purpose is different from the nervous system of your company—the network of intelligence that informs your strategy. No matter the phase of maturity of your program, all of these systems must work together across the business to excel.

The businesses we have built have transferred over to the operational side of the business at various stages of maturity. In some cases, they have moved over when they were little more than a business plan; in other cases, there was a live product, a dedicated team, active customers, and revenue. In all of the situations, the end of incubation and the beginning of operationalization requires close ties and coordination. I cannot say that we have always done this handoff to my satisfaction; each time we learn how to do it better. But building trust in that handoff is essential, and trust is the biggest indicator of how well it will go.

Your program’s scale depends on the business unit leadership’s trust in you. Your team might be staffed to execute on ideas you develop from em-

ployees, but it’s unlikely you can have a transformative impact without business leaders taking on the responsibility for execution of ideas.

We focused on building these relationships through a combination of tactics that propelled our success:

- **Servant leadership:** My team treats all relationships as “servant leadership.” Part of everyone’s job is to serve the organization.
- **Challenges:** We aim to ignite the organization through innovation challenges. For example, the innovation team ran an innovation challenge two years ago with just the leaders of the organization, requiring the submission of an idea from each leader. We then worked with those leaders to refine ideas, coaching those who continued on to each stage of our innovation challenge. Ultimately, we had nine ideas for a “pitch day,” and ended up incubating one as a new business with tremendous potential. But the real advantage of that process was more pervasive: My innovation team got to meet with those leaders, built trust, and nurture relationships that last to this day.

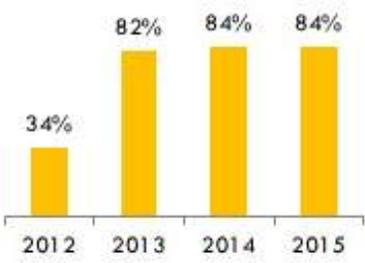
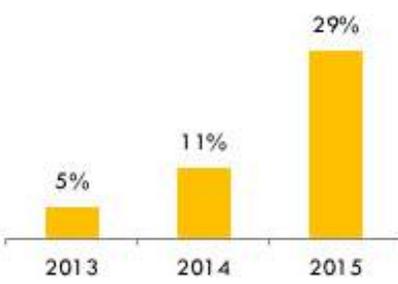
4. SHOW ROI QUICKLY

Innovation activities have a series of intermediate

A few data points from Nair’s program at Cambia.

>if

RESULTS

<p style="font-size: 2em; font-weight: bold;">2,212</p> <p>Employees engaged in innovation</p>	<p style="font-size: 2em; font-weight: bold;">23%</p> <p>Innovators receiving exceeding performance review</p>	 <p style="font-weight: bold;">84% of employees agree Cambia encourages innovation</p>
<p style="font-size: 2em; font-weight: bold;">\$171M</p> <p>Return on Value</p>	<p style="font-size: 2em; font-weight: bold;">1,662</p> <p>Ideas shared</p>	 <p style="font-weight: bold;">29% of employees are engaged in innovation</p>
<p style="font-size: 2em; font-weight: bold;">4</p> <p>New companies created</p>	<p style="font-size: 2em; font-weight: bold;">10</p> <p>Provisional patents filed</p>	



“Some ideas don’t achieve traction with *business as usual*. This was a chance for our leaders to build and socialize an idea that didn’t have a normal path.”

MOHAN NAIR
SVP, CHIEF INNOVATION OFFICER
CAMBIA HEALTH SOLUTIONS

and end outcomes. In the short term, you might have some runway to show how you are changing people’s hearts and minds, engaging them, and inspiring them to be innovative. But it is a rare organization that will not be expecting you ultimately to impact revenue or cost savings.

If your innovation team is a revenue-generator or a cost-saver, rather than a cost center, you face an easier road ahead.

When we began, we didn’t look for disruptive solutions to implement. Instead, we found a few multi-million-dollar incremental improvements and division-based ROI that gave us credibility for bigger projects. Usually, you will need to spend a year or more to develop the insights, products, and technology needed for truly transformative products and solutions. In the meantime, it’s important to have material, albeit smaller, successes to which you can point.

One example: consider tools to accelerate your sales team, for example, where you could generate substantial revenue. Again, looking for business champions and partners will also help you uncover opportunities where you can rapidly succeed. And when you succeed, highlight those business partners so that others engage with you.

5. INNOVATION AS A VALUE

My experience in strategic business transformation

(I actually wrote a book on the topic) has informed the way my team is recruited, organized, and directed.

Most innovation efforts and teams are objective- and revenue-based. This is reasonable, but limiting.

Our approach is different, and we aim for greater impact by starting with a cause: to transform the healthcare system. Our values reflect this cause, including innovation as a value.

Innovation as a value strikes deep chords for our employees and for my team. Striving to achieve a cause greater than ourselves creates passion for change that is unparalleled in the corporate world.

We can help employees with the mechanics of developing and pitching their ideas, but our true goal is to gain their commitment in helping our customers reach their best health. That passion with purpose is really the key to our program. Once that passion is awakened, we have created the readiness to truly evaluate and explore opportunities and to take the time to find ways to address them. And equally important, we have created the resilience needed to solve entrenched problems.

Remember that innovation is typically non-linear, unpredictable, and accelerated, as opposed to linear, predictable, and tied to quarterly rhythms, like the traditional business. Yet innovation systems, methods, and people must live in both worlds to achieve greatness. Achieving balance between the two is where the true benefits of innovation can be found. ♦

One innovation challenge required each leader at Cambia to submit an idea.

Anthem's Model for Thinking About Innovation Structures, Investment Levels, and Timeframes

Some of the most-photographed slides at any of our events were shown by David Crean, head of the Anthem Innovation Studio in Atlanta. Anthem is an \$85 billion provider of health insurance, with 37,000 employees, and we were visiting them as part of our Atlanta Field Study. Crean's slides laid out the way he views the different “flavors of innovation,”—from a cultural initiative to a venture fund to a spin-out company. Each one has different levels of risk, funding requirements, and potential outcomes.

The slides appear on the following page. Crean explains them in his own words here:

People around the organization—especially senior leaders—have their own opinions about what “innovation” is. It is very hard for an innovation function to be successful if the people judging it are all evaluating it differently. For example:

- A CIO might believe that it's all about experimentation with emerging tech (Tech R&D) and ask, “What are we doing with AI or blockchain?”
- A CAO or Head of HR might believe that it is all about creating a culture of innovation (Culture) or design thinking (Workshops) and ask, “How many ideas were generated, and how many associates have submitted an idea?”
- A CEO might believe that it is all about a showcase for customers and investors (Briefing Center) and ask, “How many customers have visited? Is our Innovation Center better than our competitors?”
- A COO might believe that it is all about more rapidly getting ideas/solutions to market (Accelerator) and ask, “How many initiatives have made it to market?” and “How much faster is this than the traditional way?”
- A CFO might believe that it is all about investing in startup companies (Ventures) and ask, “What investments are we making?” and “How are they performing?”

Additionally, many times, people around the organization—often senior leaders—are expecting transformational innovation, but are risk-averse and unwilling to invest at the level necessary. This becomes obvious when the funding model and level is understood. If the funding is coming from operational budgets, the innovation will be incremental and have near-term ROI expectations (Culture, Workshops, Accelerator.) If the budget is coming from the top, and is more sizable, the innovation can be more disruptive and have a longer-term ROI (Tech R&D, Vendors, Incubation, Ventures.) Discussing the second of these two slides can help people think about the choices of what to do, and the necessary investment levels and staffing. ♦

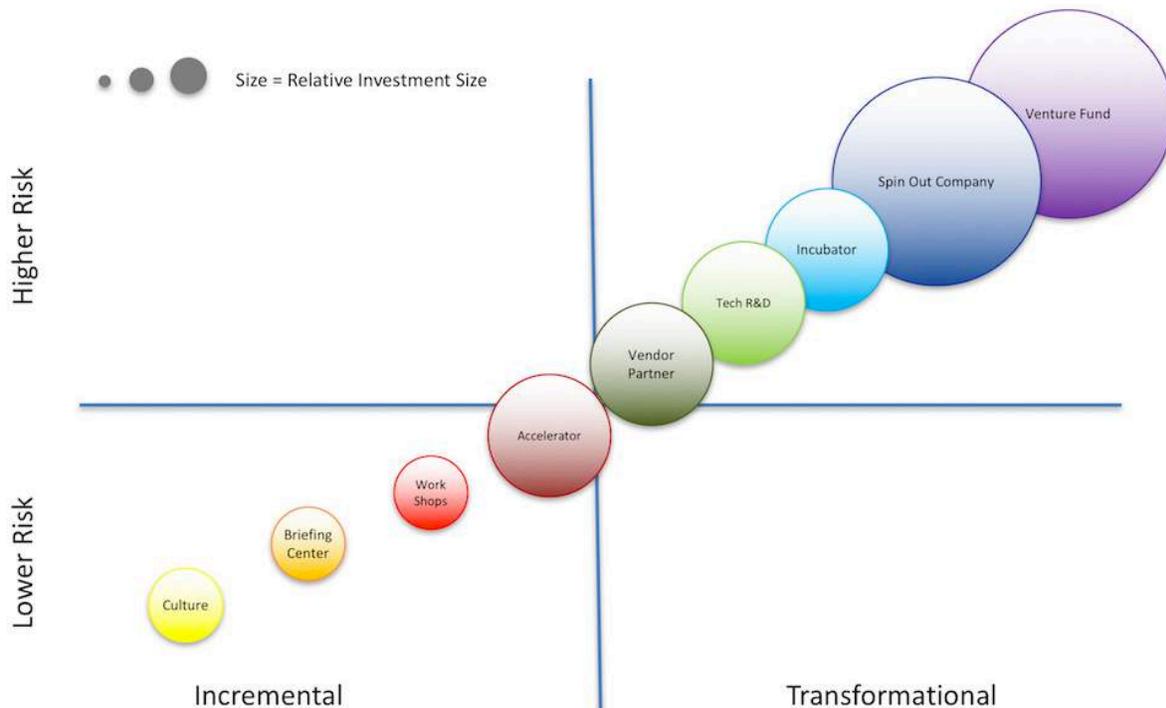


David Crean, head of the Anthem Innovation Studio

There are many flavors of innovation with varying levels of risk, transformation, and investment

Flavor	What is the Purpose?	How is it Measured?
Accelerator	To accelerate high priority innovative initiatives related to the existing business model to prove value and reduce time to market	<ul style="list-style-type: none"> • Initiatives Designed • Initiatives Piloted
Workshops	To provide the place, people, and process that are well-suited for collaboratively ideating and shaping ideas	<ul style="list-style-type: none"> • Ideas Shaped • Initiatives Approved
Briefing Center	To host visits for executives, key accounts, partners and other companies	<ul style="list-style-type: none"> • Number of Visits • Visit Survey Score
Culture	To foster a culture of innovation and encourage associates to be innovative in their jobs through socialization, education and training	<ul style="list-style-type: none"> • OHI Survey Score • Ideas Generated
Tech R&D	To identify, research and experiment with emerging and exponential technologies that could contribute to the transformation of the business	<ul style="list-style-type: none"> • Technologies Explored • Use-Cases Identified
Vendor Partner	To explore strategic alliance opportunities with vendors that drive value for Anthem and our customers	<ul style="list-style-type: none"> • Vendors evaluated • Partnerships entered
Incubator	To incubate and pilot new solutions independent of existing Anthem solutions or business models	<ul style="list-style-type: none"> • Initiatives Prototyped • Initiatives in Market
Spin Out Company	To build potentially disruptive solutions that can be commercialized beyond our business	<ul style="list-style-type: none"> • Solutions Delivered • Revenue Generated
Venture Fund	To place bets on start-up companies for eventual acquisition or financial return	<ul style="list-style-type: none"> • Investments Made • Return on Investment

An organization’s mission, funding model, priorities and risk tolerance level can all determine innovation focus



Learning to Love Innovation Day at UnitedHealth Group

BY SCOTT KIRSNER, EDITOR



Ryan Armbruster, Vice President, UnitedHealth

Can holding an Innovation Day really have an impact on a company's culture—or is it the corporate equivalent of throwing a raucous pep rally, then sending everyone back to the classroom?

For a big company take, we spoke to Ryan Armbruster, VP of Innovation Competency at UnitedHealth Group in Minnesota. The health insurer and provider of IT services chalked up \$110 billion in 2012 revenue, \$5.5 billion in profits, and has about 133,000 employees. Armbruster, who joined UnitedHealth in 2010, confesses that he was initially a skeptic about whether an Innovation Day conference would move the needle.

...

I started working in innovation a decade ago at the Mayo Clinic. At that time, very few people were spending 100 percent of their time thinking about innovation. At Mayo, we started the SPARC lab, a skunkworks focused on the outpatient experience, and later created Mayo Clinic's Center for Innovation. UnitedHealth is #17 on the Fortune 100. Coming here was an amazing opportunity to think about health and have an impact on the population. I was hired by the C-level Innovation Council at UnitedHealth. They had been doing some benchmarking before I was hired, looking at other practices at large organizations.

When I got here four years ago, I thought having an Innovation Day could be a big waste of time. To me, innovation is about deep skills and competencies, not something you just celebrate on a single day. It can take a lot of resources to do a one-day conference. I was pretty new to the company, and I didn't have an appreciation for the culture, and how it supports or inhibits innovation. At UnitedHealth and at most companies, it can always be more supportive.

We put on the first Innovation Day in 2011, in the center of the corporate headquarters. It was kind of this science fair, a low-fi way to start recognizing innovation.

But I was really surprised by it. People were shoulder to shoulder. There was an energy I hadn't seen at the company since I started. At the end of the day, I had one of our corporate executives who'd been at the company for 25 years come up and say, "Ryan, I have to tell you, I haven't seen this kind of energy since we were in the startup phase 25 years ago." The kind of recognition and celebration we were providing was a way to unlock the enthusiasm of our people.

The first year, we had 2,200 people show up in person, plus a virtual presence for others. This year, we

3,400 people in person, and we also had four regional Innovation Days. It has become a catalyst. Everybody looks forward to it. Innovation Day is organized by the enterprise-level Innovation Council and supporting team. The Council is commissioned by the CEO, and it is made up of senior executives that represent the major business areas and accountable for enhancing innovation ability across the organization. Past speakers have included author Steven Johnson, innovation guru Larry Keeley, Geeksquad founder Robert Stephens, and Guy Kawasaki. Our CEO Challenge culminates at Innovation Day. For the last one, we had 20,000 people

submit or contribute to ideas. Other employees can cast votes using play money, whether they're there in person or participating online. The winners get awards at Innovation Day. All our business segments put up exhibits about what they're working on, or what they have done over the past year. Communication is one of our biggest challenges, and Innovation Day gets people to talk to other businesses. It gives them exposure and builds relationships. There are just a lot of peripheral benefits we get out of the day from that kind of setting up relationships. I totally underestimated the impact Innovation Day would have. ♦

UnitedHealth Group Innovation Day

UnitedHealth Group created its first global Innovation Day in 2011 and has since convened annual global events in addition to four US-regional days. Innovation Day is designed to reinforce and build on the foundation of Innovation as a core pillar of Our United Culture. Innovation Day celebrates all of the great work and ideas from our talented employees who work every day to improve the health system. Importantly, the event also presents opportunities for our employees to connect with others on ideas and projects and to learn about tools, approaches and methods that enable innovation.

Innovation Day comprises the following:

- “Main Street” features a broad range of innovations from each of our primary business segments and main functional areas, displayed in interactive booths and exhibits. This creates the opportunity for employees to experience and learn about UnitedHealthcare and Optum innovations. In addition, we have recently experimented with having complementary external organizations participate here as well.
- Multiple Learning Salons enable development and reinforcement of a stronger innovation competency. These sessions focus on practical innovation tools and methods for employees to apply within their roles and also draw attention to additional learning resources that can be accessed throughout the year.
- The six-week CEO Challenge culminates at Innovation Day, where finalists display their proposed solutions to a strategic company opportunity or obstacle. Employees vote for the best solutions and the top solution is presented that evening, with the winner invited to present their solution to an enterprise-level Innovation Council for further development.
- Keynote speakers bring additional energy and perspective (typically from outside the healthcare industry) that aligns with the core theme of the day. This typically involves three to five prominent speakers from within and outside the organization.
- Awards are given at an evening reception. This includes the CEO Challenge winners in addition to awards provided for the best innovations from each of our business segments.
- A virtual experience of Innovation Day is also available for employees around the globe, with video, photos, and voting capabilities

The first Innovation Day drew 2200 in-person participants and immediately became the largest annual company event and as such provides broad cultural benefits beyond our innovation agenda. In 2013, over 3400 people attended. The energy and momentum generated from this forum has contributed significantly to UnitedHealth Group's ability to successfully achieve its innovation agenda.

Retail, Distribution & Data

Inside the Customer-Focused Fuse Lab at Cardinal Health **71**

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How the CVS Digital Lab Proves Value and Collaborates with Business Units **77**

Inside the Customer-Focused Fuse Lab at Cardinal Health

BY SCOTT KIRSNER, EDITOR



Brent Stutz, Chief Technology Officer for Cardinal's pharmaceutical business

In 2013, Brent Stutz of Cardinal Health was hunting for a place to plant a new innovation center. Given the center's focus on building new technologies to support the healthcare industry, some suggested that Silicon Valley or Boston were obvious locations. But Stutz was convinced that it'd be hard to move many of the company's top technologists out of Dublin, Ohio, where \$102 billion Cardinal is based, and that he wanted a spot where senior executives could visit regularly, as opposed to once or twice a year.

"If we're enabling our business to do incremental and disruptive innovation, it needs to be pretty close to our headquarters," says Stutz, Chief Technology Officer for Cardinal's pharmaceutical business.

The problem was that many of the places that Cardinal's real estate team identified felt "incredibly boring," he says. "You'd get off the elevator on the third floor of some boxy building, and it looked just like you were at any other Cardinal Health location."

Stutz also was working with a build-out allowance of under \$2 million; his boss, Mike Kaufmann, suggested keeping the project under the radar from a spending perspective, so they could move quickly.

As Stutz was beginning to despair about finding the right spot, he got a call from a friend, Bob Myers, who runs Pillar Technology, a digital development firm. "I've found your space, and I'm gonna show you," Myers announced. He drove Stutz over to a Halloween pop-up store in a strip mall. It had a street-level entrance, and was walking distance to a few bars and good restaurants.

"When our senior leaders came, they had major reservations about it," says Stutz. "There were crazy witches popping up when you walked around it, since the Halloween store was just closing down. They were like, 'You want this to be your innovation center?' I said, 'Just trust me.'" Stutz reports to both Cardinal's Chief Information Officer and the CEO of Cardinal's pharmaceutical business.

THE VISION

Stutz dubbed the new center Fuse, since the vision was for it to be a place where Cardinal's technology expertise, healthcare industry knowledge, and customers' needs would all come together to ignite new projects. "When you come to Fuse, it's all about the customers. It's customer-in." Visiting employees and executives "would leave their business unit affiliations and their badges behind."



At Fuse, Cardinal wanted to create a distinction between the technologies it uses internally to run its business, and the commercial technology it deploys to customers like pharmacies, hospitals, and oncology infusion centers. There was a sense that the teams building commercial technology needed more opportunities to interact with and build with customers, and they needed to embrace more flexible development approaches like agile, lean startup, and design thinking.

Stutz likes to say that Fuse works on solutions for hospitals, specialty clinics, and pharmacies. And, he adds, “we are starting to build solutions for patients, [as a way of] enabling our existing customers to build better relationships with their patients—think B2B2C.”

CONTEXT-SWITCHING

Working with the Columbus-based architecture firm WSA Studio, Stutz transformed the former Halloween store, adding a bright orange vestibule, an iris scanner for secure access, a large poured concrete table that would bring people together for lunch, and lots of glass. “In our huddle rooms, you can see who’s in there together—everything’s open and transparent, like we want to be.” There are no cubicles—just high and low tables that fit about six employees. “My team size for an agile or design thinking project team is from six to twelve,” Stutz says. “So teams are either one table or two tables.” A team typically focuses on a specific customer project or exploration, like

medication adherence, or consumer wellness.

There is a ping-pong table in Fuse’s front lobby that gets heavy use, and a game room with an Xbox and Wii that employees brought in; those get used less often, Stutz says. But the bean bags and large TV in the game room serve as a comfy place for code reviews. “You’ll find a team sitting in bean bags and use the big monitors for their Macs, doing code reviews and talking about requirements,” Stutz says.

Installing a kegerator in Fuse’s kitchen required roughly “30 hours of executive meetings about the risks that someone would get drunk at Fuse,” and the company would be liable. But Stutz prevailed, and a Fuse employee used some of his “spark time”—four hours of undirected project time every other Friday—to build a device that monitors both who is using the kegerator to dispense beer, and how much beer remains in the keg. There are some common-sense rules: employees chip in for beer; the keg doesn’t get used before 4 PM; and interns don’t have access, regardless of their age.

“When people are coming to Fuse from their daily job, you want to hit them with a little shock and awe,” Stutz says. “You’ve got to have people context-switch. We didn’t want senior executives to act like they act at headquarters.” But another benefit of the non-traditional space is that Fuse helps Cardinal attract technology talent—from data scientists to user experience specialists to research analysts—who might not otherwise consider working for the company.

Ray Li in Fuse’s game room.

STAFFING, EVENTS, PROJECTS SO FAR

Work on Fuse started in February 2014, and employees began moving in that May. Roughly 100 people work out of Fuse—though about 20 percent of those people don't use it as their primary workspace. "They may be a sales VP who has brought in a customer with a pain point, where they want to do some design thinking work with them," Stutz says.

"I have a finance person and HR person who sit at Fuse," he adds. "We have a completely different review system for hiring, for budgeting, for performance reviews" that offers more flexibility than the "mainline" processes at Cardinal. As an example, leaders commit to approving the funding for new product development in 48 hours or less—after an experiment has met its targets. That's in contrast to a year or more of developing a business case and presenting it to a committee that may or may not give it the go-ahead.

One of the higher-profile projects to emerge from Fuse is Cardinal Health MedSync Advantage, which helps pharmacists identify patients who would benefit from medication synchronization, so that patients can pick up all their medications

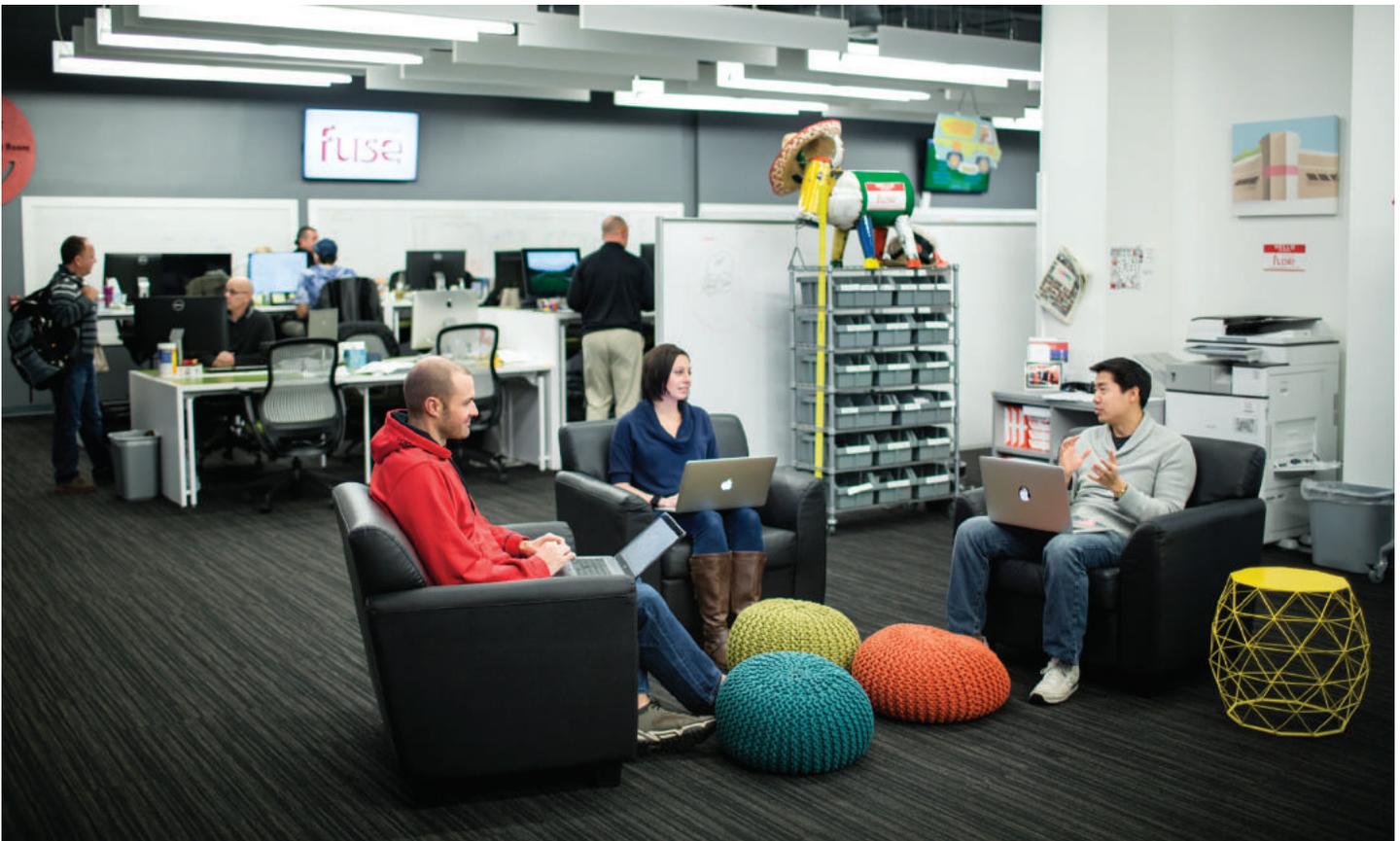
in just one trip. That offering was developed by a Fuse team in collaboration with Cardinal Health Innovative Delivery Solutions, which was responding to an issue a customer had flagged.

Fuse regularly hosts hackathons, tours, student coding bootcamps, and after-work meetups on topics like lean startup, agile, and the Hadoop programming framework.

While the initial plan was to set up Fuse with its own P&L responsibility, with the ability to launch new offerings, that has changed. Fuse has built a reputation as a place that can get things done fast, and bring customers into the development process, Stutz says. But he has acknowledge the need for allies within Cardinal's lines of business, some of whom will rotate through Fuse on assignments. The notion now is that Fuse will serve as test-bed, and that once projects prove their worth, "we'll scale and commercialize them through the businesses."

In the two-plus years since it opened, Cardinal executives now believe that Fuse "has done as much for our brand as our new marketing and advertising campaigns," Stutz says. "It has created a sense that Cardinal is willing to listen to our customers." ♦

Fuse employees often review projects and software code in communal seating areas, rather than conference rooms. Here, Kenny Brady, Jessie Olesnanik, and Edward Liu connect.



Why UnitedHealth and the Mayo Clinic Created Optum Labs

BY JULIE DONNELLY, CONTRIBUTING WRITER



Dr. Paul Bleicher
of Optum Labs

In early 2013, health insurer UnitedHealth Group and the vaunted Mayo Clinic in Minnesota had a big idea—to create a kind of Bell Labs for the healthcare industry. The initiative, called Optum Labs, and overseen by UnitedHealth’s IT division, Optum, would seek to leverage “big data” to improve patient care and lower costs by convening a new alliance of companies and universities that would share information, technology, and scientific expertise.

The new venture, flush with cash and a swanky Cambridge, Mass. office, first had to convince top healthcare players, including universities and life sciences companies, to play together in the same sandbox for the greater good. Optum Labs, led by Dr. Paul Bleicher, left, now boasts 15 partners, including medical device giant Boston Scientific and drug-maker Pfizer.

There are currently more than 40 projects underway, including 21 launched by the Mayo Clinic. Bleicher talked to us about moving from building mode to operations mode, and attaining long-term sustainability. He also shared a few slides.

DEFINING THE VALUE PROPOSITION

Optum Labs, when it was launched, represented a big investment from UnitedHealth Group and Optum. What was the value proposition for the partners?

In the rest of the Optum business, Bleicher says, the team would have an RFP and go in and pitch why Optum is the best at meeting that need. But in this case, the potential partner “doesn’t know they need what we have, but they generally know they are willing to spend money on certain projects that would allow them to be seen as thought leaders, allow them to be associated with advances in medicine, and allow them to bring value back into the organization from learnings.” After the initial announcement, 150 potential partners responded. But to identify key players and close deals, Bleicher and his team presented individual pitches to specific partners they hoped to attract. First, they researched challenges at the organization, then proposed how partnering with Optum Labs could help launch and advance research initiatives designed to go after those problems.

“When you have to go out and sell it, you have to understand, from the point of view of the potential partner, how is it going to be of value, how much will the value be offset by contributions

I would make, and how long will it take for the value to be realized,” Bleicher says.

At the beginning, Bleicher says, Optum Labs would take any partner that wanted to participate. Now he is becoming more strategic about “filling holes.” Some of the holes he wants to fill include a large employer which is itself a healthcare payer, and health policy academics.

SHIFTING THE MODEL

One of the unique features of Optum Labs is that some of its partners are also competitors in the market. This was by design. Optum Labs even has one conference room where the glass walls can be made opaque with the flip of a switch, if two competing partners are holding meetings on-site at the same time.

But that meant dealing with sensitivity about what each partner might share. Bleicher said Optum Labs initially envisioned that each external partner would share data, such as anonymized patient information gleaned from clinical trials. But some potential partners balked.

“It became very quickly obvious that that wasn’t necessary,” he says. “There were organizations that could come in and bring a lot of value without actually contributing data. As time has gone on, our focus on data has become a strategic concept. We’re not just taking data from anyone that comes in, we’re assessing what data is really needed.”

Another key change in the model centers on defining the drill sites for ideas, and developing a long-term revenue stream for Optum Labs.

“We had a vision initially that we would seek out the best and brightest and they would come in and they would have very particular interests, and there would be bright stars, constellations of ideas,” Bleicher says.

These constellations might have to do with a specific therapeutic indication, such as Alzheimer’s disease, or they might be more aligned with specific analytic methods, or something else entirely.

But over the past nine months, Bleicher says, it became clear that it made more sense to ask large partners to sponsor a specific constellation of interest, and then attract complementary partners, such as academic researchers, clinicians, health IT firms, and employers to also work on the constellation.

One reason for the shift is to help Optum Labs pay for itself long-term, following the initial

investment from UnitedHealth Group.

“It became clear that the best way to build the organization we want is to become sustainable and that would require investment from the partners that were going to join us,” Bleicher says.

Currently, Optum Labs has one funded constellation focused on congestive heart failure, sponsored by Boston Scientific. The medical device company will collaborate with other external partners, such as academic researchers, to advance research that will hopefully yield new devices, processes, or health IT apps.

Bleicher hopes to have another two or three funded constellations by the end of 2014.

DRAFTING THE RULES

One important way that Optum Labs differs from

Value Proposition: Seat at the table of health care innovation

- Tackle the biggest issues in health care
- Develop your big data strategy
- Create innovation
- Identify patient cohorts/best practices
- Accelerate best practice translation
- Lead a national, multi-partner collaboration



Optum Labs: Driven by Data. Powered by Partners.

First open, collaborative research and innovation center to accelerate innovation, leading to improved patient care and patient value.

- ✓ Founding partners: Optum and Mayo Clinic
- ✓ State-of-the-art facility in Cambridge, Mass
- ✓ Pre-competitive research collaborative
- ✓ Pre-commercial innovation center

Goal: Large, diverse, de-identified, patient database

Vision = Accelerate Change Thru Collaboration

- Comparative Effectiveness Research
- Faster Clinical Translation of Best Practices
- Innovate New Predictive Models, Tools & Care Pathways



innovation shops at other large companies is that often two or more organizations share ownership of intellectual property and other assets that result from research projects.

“If you want three kids to share a big piece of cake, one splits it in half, the second one chooses a half, then the first two divide each half into three parts. The third kid picks one from each of them. It forces them to do it fairly. It’s the same concept here,” Bleicher says.

This means the parties create a statement of work for any project. It contains a description of research, the intellectual property contributed or expected to be produced, and an agreement of who owns what and how it is to be divided. Optum Labs is one of the partners, and will have the opportunity to realize royalties from innovations incubated there.

Bleicher said there have been some bumps in the road as Optum Labs begins solidifying its standard operating procedures. Some of the hiccups are purely technical—like setting permissions and passwords for certain data, and getting software to run on different computers.

Others have to do with better deploying staff to meet changing needs. Optum Labs is working to streamline how partners submit research proposals, how they are reviewed, how partners are trained in using the database, and how they are trained in privacy. Bleicher says that as the number of partners and projects grows, he envisions having an “account manager” for each partner. Bleicher says they are hiring to fill some holes, and reconfiguring staff to better meet the lab’s evolving needs. He says he plans to rearrange staff about every six months.

“We’re transitioning from ‘building’ to ‘operations’ mode. We now have a bunch of partners, working on a bunch of projects and we need to make sure we help them get to the results that they are looking for.”

MEASURING SUCCESS

Bleicher says Optum Labs has an “audacious” ladder that represents its short, medium, and long-term goals.

Lowest rung: Optum Labs will generate dozens of important papers in Health Affairs, New England Journal of Medicine, the Journal of the American Medical Association, and other journals. Bleicher considers this the minimum bar of success.

Second rung: Optum Labs will develop innovations and spin off products and companies that will make a difference in medicine.

Third rung: Optum Labs will become the premier organization for doing innovation and research using healthcare data.

Top rung: Optum Labs will incubate one or more major innovations that change the face of medicine. “What do I mean by major?” Bleicher asks. “This is probably not in our wheelhouse, but the concept of an Accountable Care Organization or something like that. That’s our wild goal that we’d like to achieve.”

ON RESULTS

“The natural human tendency is to say, ‘OK, it’s up and running, let’s see results,’” says Bleicher. “People always ask me, ‘Has anything come out yet?’ And now some things are starting to come out, so that’s good.

We have some internal goals about numbers of publications, numbers of partners, numbers of clinical translation projects and things like that. But I think everyone understands that in the real world, we’re gonna have to see how it goes and how the process is. UnitedHealth is committed to this. They’ll measure the value they get from it against the cost and we hope it will also show we are ahead of the curve.” ♦

How the CVS Digital Lab Proves Value and Collaborates with Business Units

BY SCOTT KIRSNER, EDITOR

At our Boston Field Study in October 2015, we dropped in on CVS Health's new Digital Innovation Lab and met with Chief Digital Officer Brian Tilzer. After the group toured the lab and got demos of several lab projects, Tilzer sat down with participants to discuss why the \$139 billion retail and healthcare giant set up the facility; how it connects with teams at CVS' Rhode Island headquarters; how they set priorities; what happens when projects don't pan out; and his thoughts on mobile payments, videoconferencing and collaboration, and in-store Bluetooth Beacon technology.

...

NOT A STAND-ALONE BUSINESS UNIT

A lot of this lab is really to help CVS connect with the outside world of innovation—the investment, the talent, the energy, the ideas—and bring it into a company as big and as complex as ours.

I'll give a little context on digital at CVS and then the lab will make more sense. I'll tell you what it's not: what we're not trying to do is create a stand-alone business unit called CVS Digital Inc. I am not the president of CVS Digital Inc. I'm not driving towards a P&L that gets reported separately from the rest of the enterprise. A lot of big companies have been down that path. That's not what the idea is for us.

We think digital is a catalyst for disruption and change in an industry that really needs it. Healthcare is changing in this country. Historically, it was centered out of the hospital in the big urban center. Doctors told patients what to do and patients were supposed to comply.

Digital has turned both of those things on its head. CVS has as well, which is basically taking healthcare closer and closer into the community. Digital is going to bring it into the home. It's also putting the patient in control, in a way that wasn't possible before.

We want to be at the forefront of that. Our mission is putting people on the path to better health. I'm sure everybody knows us as the drugstore on the corner. We are that, but we aspire to be a lot more than that. We have an array of healthcare and pharmacy products and services that is really unique.

Digital is ultimately about making [healthcare] much more accessible, convenient, [and] proactive for the consumer. Orchestrating all that we do



Brian Tilzer, Chief
Digital Officer,
CVS Health

around the mission of making someone's life and healthcare situation easier to manage.

I've been with CVS for about three years. We started this focus on digital then. Our initial initiatives were much more internally-focused, putting in place the enabling infrastructure and capabilities that we just had to build ourselves [such as a web services infrastructure that allows Tilzer's team to plug into many other legacy systems at CVS.]

RATIONALE FOR CREATING A NEW LAB

Then, as we thought about how do we move forward and create this vision of really transforming our company and healthcare system, we said we couldn't do it by ourselves. We needed to become much better at harnessing the talent, the investment, the innovation outside of CVS—connecting it and bringing it into our ecosystem to invent things that wouldn't be possible for us to do by ourselves.

We thought we needed an office that was about engaging and partnering with promising younger companies, and also mature companies as well.

[We also needed] the ability to rapidly prototype and bring to market and iterate and co-innovate, to figure out how these new technologies could be relevant to our business, to our customers, and ultimately be incorporated into our business model.

We decided Boston would be a great location for that kind of lab, at a really neat intersection of all the technical innovation going on in Cambridge and the teaching hospitals right down the street. We've been at this now for about six or seven months.

LONG-TERM INNOVATION VS. SHORT-TERM RESULTS

[Within] big companies, you need to embrace some paradoxes. What I mean by that is on the one hand as human beings, as senior leaders, people want to be inspired by a purpose. We needed to create that big, bold vision of what digital could be.

Is digital just about selling Tide online, competing against Amazon at CVS? Is it actually something bigger? [For us, the] purpose is helping millions of people live healthier lives by making healthcare and pharmacy more accessible. That's something we believe in. That's our guiding light.

Then, we're a publicly-traded company. How is it that I, as the senior leader of the digital team, is

getting every last investment dollar channeled, so [our] talented people can actually go to work?

The way we do it is by generating impact and showing momentum. This notion of [having a] big, long-term vision, but also then building momentum and getting a snowball rolling downhill is the most critical thing we've had here. Without the vision, people would be saying, "Well, geez, how are you guys going to beat Amazon in selling Tide?" The answer is, we're not.

Without the short-term stuff, [what you are doing is] nice in theory, but how are you contributing to the quarter? As much as we want to be a healthcare company, we still have so much retail mentality in our culture that will be there forever.

PROVING THE VALUE OF DIGITAL INITIATIVES

How is it that digital has value? If I put a million dollars into something in digital, how does that translate to [our] financials improving? Prove it to me. That's something we worked really hard at.

We now have a very precise model of, if I do X digitally, it translates to better medication adherence, which translates to more [prescriptions], or it translates to a customer who's self-servicing for things that they might call for... It's eliminating workload in our stores. Those kinds of models and

“We talk about moving from hypothesized value to proven value. ...You deliver the work, and you deliver the outcome. You start getting some credibility with the management team.”

BRIAN TILZER, CHIEF DIGITAL OFFICER, CVS HEALTH

those kinds of linkages are something that we've worked really hard at establishing.

We talk about moving from hypothesized value to proven value. The first couple years, we made statements like, "We believe if we actually get people to do X, Y, and Z, it will generate this number of [prescriptions.] Here's our assumptions." Then we said, "Give us a year to actually show that correlation."

We showed the correlation, and we actually delivered the work. You deliver the work, and you deliver the outcome. You start getting some credibility with the management team. I think that's point one.

The other thing is the collaboration model. Our vision for CVS digital, like I said, isn't a standalone business. We're trying to weave digital



The entrance to CVS Health's Digital Innovation Lab in Boston.

into every aspect of our operations and business model.

RELATIONSHIPS WITH THE BUSINESS UNITS

In order to do that, we can't do anything alone. We can build websites alone but, to have digital transformation have impact, we [have to build relationships with business units so that] ultimately, the head of our pharmacy business in retail is saying, "I believe in what this impact is going to be. It's going to hit my budget on this line item."

This is where it's tricky. We're an enterprise organization. We report our results in terms of retail versus Minute Clinic versus Caremark. The reality is we have about eight discrete business units even within that. Each of those different teams need engagement and need partnership.

We're organized [so that] we have a set of capabilities, like our lab, that work across the enterprise. Then we have business-unit-aligned teams that become extensions of the management teams in each of those areas, to ensure that we're work-

ing on the stuff that creates value that ultimately shows up in the P&Ls across the businesses.

I think it's been those two things—the collaboration with our partners, and the correlation to impact, that has been really important.

LINKAGE BETWEEN THE LAB AND HQ

When I was interviewing for the job, I did have the conversation to say, "Hey, guys, if I were to come back in a year or two and say we're going to need to open an office [in Boston or the West Coast], what's your reaction to [that]?"

I was making sure they were open to listen. If I had gone in [after] my first three months here and said, "Guys, we need to open a lab in Boston. I'm going to have 100 people located 60 miles from the home office.

We're going to be in probably some of the most expensive real estate in the company. It's going to have an innovation lab," I think I probably would have gotten a two-by-four taken to my head, in a nice corporate kind of way.

Timing's everything. This group had to demon-

strate we could deliver impact, and we could deliver impact through and in partnership with the business units before there would have been that kind of will. I think that's the foundation.

The trick then is, how do we have independence and also continue to work with the business units? I think everybody who is working out of this lab is spending time in Rhode Island at some frequency. That's part of it.

We're getting better at the virtual thing. Within my team, I'm a pest about being accessible by Jabber [the Cisco videoconferencing and collaboration software], so we can do face-to-face. I know that when someone's on the phone with me, they're not doing their e-mail or I'm not doing it.

When you're working with the Minute Clinic digital team, that's one thing. When you're working with the [rest of the] Minute Clinic team, a lot of face-to-face [at headquarters] is important. That comes with the gig. I think that's an expectation we try to set with everybody.

STAFFING THE LAB AND TRAINING LEADERS

We've selected people that we think can be both innovative and creative, but also understand what it would take in the bigger company to get stuff done. I put my entire leadership team, directors and above, about 50 people, through a course called "InterActive Leadership" with Burnham Rosen. It's a great framework to think about an interactive model for leadership. That's a big investment we made...to try and build those skills.

We've hired people from some of the biggest digital shops. Someone in the back row joined us from Sapient. We've hired people from Google. [Our CEO has said that in the past, CVS] tried to hire "ringers" from other retailers. How do you figure out which ones can be successful at CVS?

I think the big thing is really the organizational integration. No matter how hard we try, we are not going to be the fastest company... We've got to get faster, but we're never going to be the fastest.

What we have to have is people who are inspired by the platform that they can work on. This is a platform where your ideas, when they hit, we [have] a million customers in our stores every day. We can drive 10 million downloads [of] an app just by making it a priority.

The scale and the impact is really large, so the people who've been more successful are the ones who get excited about that, and are willing to invest the energy to integrate.

DOING THINGS FASTER

The way we started this lab was [that] it was sort of directed innovation. I established a budget that said, "Here's how much work we will invest." It's things that are not necessarily clear-lined to be return-generating this year, or maybe even next year, but are important.

Some of the things [we do here], like the notion of allowing someone to easily identify themselves and authenticate themselves [on a mobile device] is so foundational to a business like ours. We also want to be personalized in our retail business.

We said, "You know what? That's something we're going to do." We put up money, resources, and talent behind it to innovate, and to get traction going and get the process going. Now what's happened is the lab has proven to be, for certain kinds of projects, a better way to get stuff done.

Suddenly, people said, "Huh. I can get something done faster [by working with the lab] than through the old process. What if I wrote Mr. Vijay [Kukreja, Director of Strategy and Innovations] a check that says, 'I will let you go do this'"—by the way, he has an IT partner as well—"but we're going to do it the lab way."

What we're increasingly seeing is we basically have the two-tiered process. We have directed innovation, where Vijay, I, or others on the leadership team are saying, "This is important. We're going to invest behind it," but it's also becoming an alternative path to getting stuff done.

"Timing's everything. This group had to demonstrate we could deliver impact, and we could deliver impact through and in partnership with the business units before there would have been that kind of will. I think that's the foundation."

BRIAN TILZER, CHIEF DIGITAL OFFICER, CVS HEALTH

I think that the next step on the journey is going to be like, "Well, if it was a better way to get stuff done, why don't we change our core process?"

In the directed innovation, a very small group of us can be very top-down—driven around what has the highest financial value, customer value, and strategic value. [With] the business unit funding, we're actually [letting] the free-market work, which is to say someone's got money. They're excited about [an idea, and working with the lab.] Let's see what happens.

WHY WE KILL PROJECTS

I can think of an example where [we were exploring] a technology to recognize a driver's license and process it and use that as source of authentication. It was actually a vendor that I had identified initially.

Through the rapid prototyping, it became pretty clear that the vendor didn't actually cut the mustard. In that case, I think that wasn't meeting our business requirements and we were able to cut it off.

We're still in the market for a connected adherence pill cap kind of device, [to monitor and remind people to take their medications.] We had a few concepts. We had done one skunkworks effort to try to build our own. I think the team, and I have to give Vijay a lot of credit, just said, "Guys, this isn't going to work," and just killed it. Probably, we're going to have to do a lot more of that as we get more mature.

ESTABLISHING PRIORITIES

Let me just explain the model that we have within my team. I have business digital teams that are

aligned to each business unit within CVS. We have a whole digital business that's working every day with our merchants and the managers of the ExtraCare [loyalty and coupon] program. They're working on a set of initiatives to drive value and create more impact.

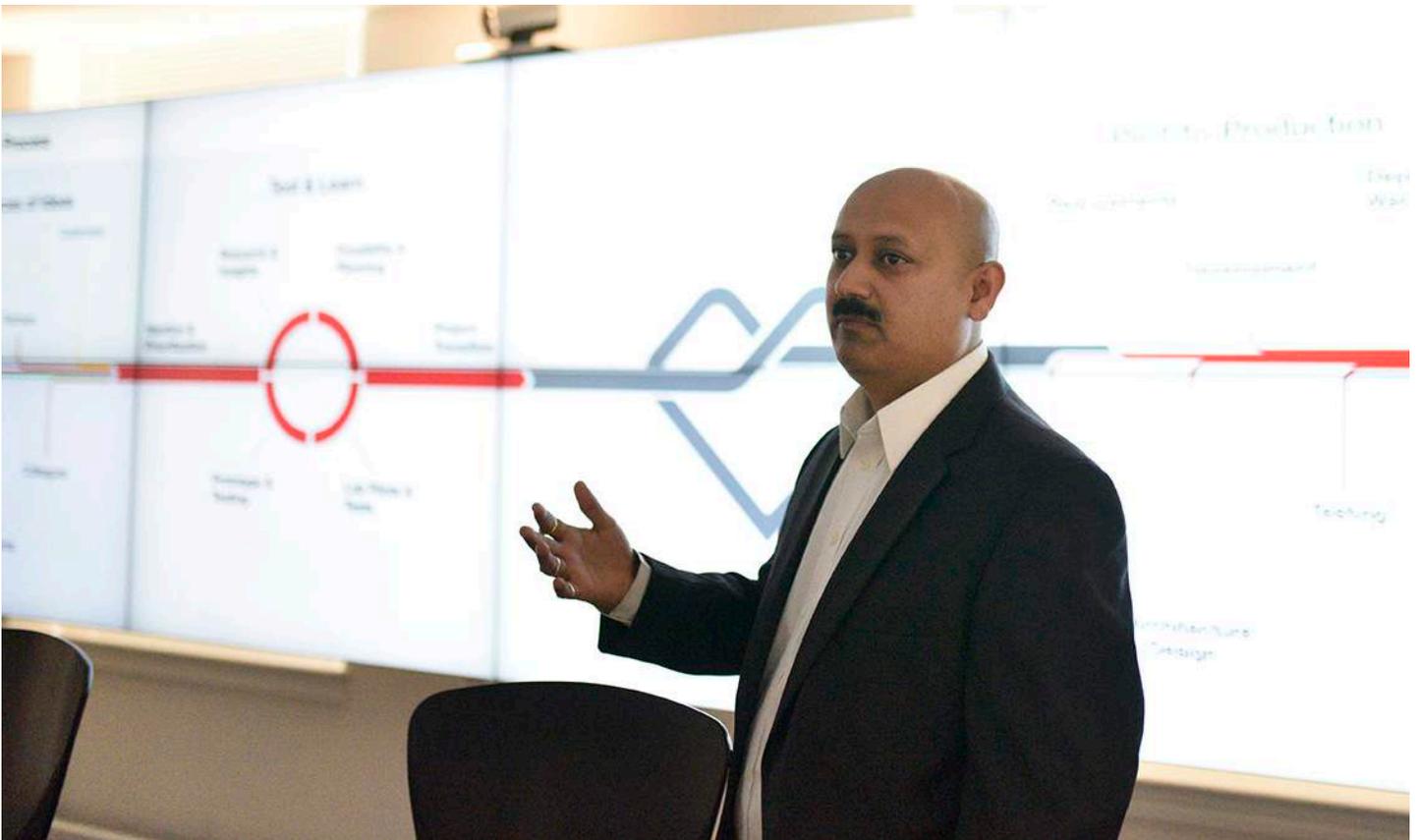
The innovation teams, then, are working first with the business unit. Through our business units we have very clear priorities. We're trying to make the way that our customers engage with the ExtraCare program, as an example, all mobile-driven.

We're doing that through our digital business unit and a partnership with our loyalty team. The business priorities have been established.

I think the role of the innovation team is within the areas of directed innovation, where we say we are trying to explore X. [Our teams] become experts on how to identify a human being and get them registered, which is as important in a pharmacy business as [it is] with registering someone for a loyalty program. They're bringing in ideas [aligned to our interests.]

There's also a few projects [where business unit teams] are coming to the lab and saying, "Hey, we want to do something like this. We need your help in actually bringing it to market faster."

Vijay Kukreja, Director of Strategy and Innovations, CVS



LOOKING OUTSIDE OF CVS

Our strategy started with a commitment to being part of the digital ecosystem. That's actually a big point that has taken alignment-building within CVS. We just announced that we are partnering with Rock Health and MassChallenge, which are east coast and west coast [startup incubators.]

That's new thinking for CVS. [We also now have] a commitment to on-going dialogue with big tech companies that we have a lot of mutual interests with. [We also have] committed, on-going, regular [discussions] with five to seven [venture capital] funds that we think are particularly relevant to our space. We're going to announce in about a month our first strategic investment in a company that we're working with through those efforts.

'THESE ARE THE THEMES WE CARE ABOUT'

In terms of [our] approach though, the question has been, what are the spaces, the filters we're going to use to say, "Where do we focus our innovation efforts," and, "What is beyond the scope?"

We worked really hard to say, "There are four themes that we care about. Within those themes we define them as X, Y, and Z."

I'll take digital health. That's one of the themes we're interested in. For those of you in healthcare, the [term] digital health is like a hundred miles wide. We could be investing in anything from the next Fitbit to information healthcare technology that hospitals use. We needed to define which pieces of that space we cared about, and get aligned with our management team. For lack of a better word, it's a shopping list.

Some companies go into this saying they want to have a fund in healthcare. I think Merck's very public that they [have a] venture fund. We're not in the business of being a venture company. That's not what we want. What we want is innovation. If the right way to pursue it is making investments in companies, then that's what we'll do.

Here's what we offer and here's the pitch. To healthcare companies, what's unique is that we are both a retail pharmacy and we're a PBM [pharmacy benefits manager.] There's not another company where you can work with and have a scale of opportunity both in the B2B2C and the B2C spaces as working with us. I think that's a unique value proposition.

If you're a CEO of a pretty young technology

company, why wouldn't you want your technology embedded in one of the few sectors of the economy that's actually growing very well?

I think that's how we become unique, but at the end of the day, information flows freely. These things ultimately become competitive.

HOW WE WORK WITH CORPORATE IT AND MARKETING

We don't do the engineering work ourselves. We have a dedicated IT engineering team that works with us. Obviously there's a tension in terms of speed and agility, versus stability, and just how digital applications get developed—it is very different from back-end infrastructure. I think that exists in most companies.

I think our corporate marketing team is ultimately the steward of our brand. I think they rightly see that the digital solutions we're bringing to market, and the rapid adoption we've seen, are actually the best proof points of our brand purpose that they've got. I think increasingly, you're going to see more and more of our brand media going towards supporting the digital message.

"If you're a CEO of a pretty young technology company, why wouldn't you want your technology embedded in one of the few sectors of the economy that's actually growing very well? I think that's how we become unique, but at the end of the day, information flows freely. These things ultimately become competitive."

BRIAN TILZER, CHIEF DIGITAL OFFICER, CVS HEALTH

MOBILE DEVICES VERSUS IN-STORE TECHNOLOGY

I'm really excited about the mobile device because it's something that now 76 percent of the population has, and is using, and is comfortable with. There's so much capability that exists in that.

We've made investments in things like iBeacon technology. We've rolled that out now nationwide and we're using those. We're trying to add power to the mobile experience. We're still going to have in-store technologies that we invest in, but I just think that we're so early in the impact curve around leveraging these devices we're carrying around with us. I think that's more of my focus right now. ♦

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HUMANIZING CARE

The best thought solutions don't always have to be complicated.

Using "Know Me," "Surprise Me" and "Make It Easy" will reconstruct the customer experience.

Disruption is healthy and necessary for growth and leads to new ideas that change the world (your world).

Ideas that are radical enough to change lives require a space for teams to create, develop, test, and implement.

Engaging consumers' stories and voices are mission critical when exploring new ideas and the ONLY way to do business well.

Figuring out the right questions to ask takes time and energy.

With the Power of YES, anything is possible.

