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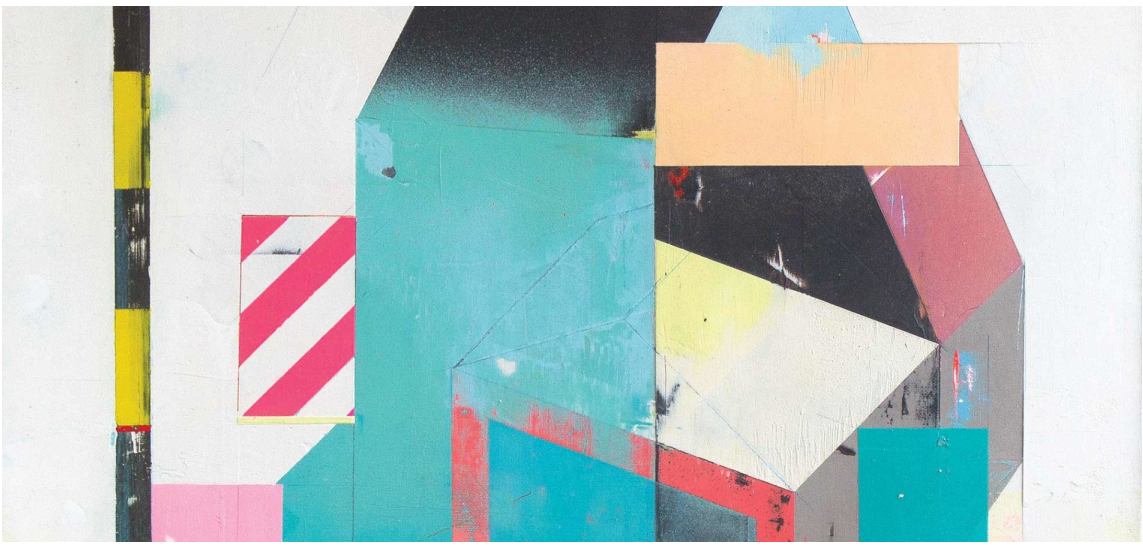

INNOVATION

Managing Multiparty Innovation

by Nathan Furr, Kate O'Keeffe, and Jeffrey H. Dyer

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On an October morning in 2015, inside an aging beer factory in the Tempelhof neighborhood of Berlin, a group of people assembled amid idle machinery in the hope of transforming their respective industries with a novel approach to innovation. Standing shoulder to shoulder around oil barrels converted into temporary tables were innovation mavericks and senior executives at large established companies—Airbus, DHL, Caterpillar, and Cisco.

The gathering, hosted by Cisco, the California-based networking and technology company, was a crucial point in a process carefully designed to tackle the most pressing challenges at the intersection of supply chain and digitization. The goal: launch partnerships for groundbreaking solutions to shared problems within the next six months.

In an increasingly digital and connected environment, leaders of established companies frequently find themselves facing opportunities that they—or even their industries—cannot seize alone. The Berlin "Living Lab" (the name Cisco gives to such events) was a unique model for

addressing such opportunities. Instead of relying on start-ups to create innovations and then buying in to them, organizations taking part in this new process, which we call *ecosystem innovation,* collaborate to develop and then commercialize new concepts.

Cisco Hyperinnovation Living Labs (CHILL) differs from seemingly similar approaches, such as R&D alliances, because it focuses on the fast and agile commercialization of ideas without a complicated intellectual property agreement. It also differs from traditional partnership efforts, because it brings multiple partners together at a very early stage all at once. "We believe that no one company can deliver the full breadth of technology solutions that customers need at the pace the market requires," says Chuck Robbins, Cisco's CEO. "This process brings our teams together with partners, customers, and other companies working to find new business opportunities. Through intense analysis and collaboration, these lab sessions result in breakthrough ideas that can be implemented or invested in by those that participate, including Cisco."

Learning from R&D Alliances

We're often asked how ecosystem innovation differs from R&D alliances, another kind of collaboration we've studied in depth. R&D alliances usually focus more on developing innovations, whereas ecosystem innovation focuses on commercializing them.

Another fundamental difference is that ecosystem innovation is designed to discover, explore, and validate big opportunities across companies in a very short period of time. Often a start-up is launched within or across companies to pursue an opportunity. In contrast, R&D alliances are designed to explore and build knowledge that has been carefully defined by the collaborating firms at the outset, typically over a period of years.

A third difference is governance. R&D alliances typically rely on elaborate contracts or equity (in a joint venture) to protect IP. Cisco Hyperinnovation Living Labs (CHILL) takes a simpler approach,

At the Living Lab in Berlin, one team addressed the data-sharing problems that were created by multiple proprietary platforms; along with four universities, it is in the process of creating a cross-industry open-data platform to encourage application development by other start-ups. Another team sought to update the "pen and paper" tools used by most warehouse workers: Its solution was to replace them with augmented-reality wearables—and to design a pilot that launched in a Houston warehouse 60 days later. Cisco has applied this ecosystem innovation process to challenges in supply chain, retail (convening Nike, Costco, Visa, and Lowe's), and health care (convening the University of California, San Francisco; Community Healthcare Network, Walgreens, and Vocera), and will soon host a lab in finance.

making a team's discoveries available to all participants in proportion to their investment in them.

That said, our study of R&D alliances has produced insights that may be valuable to other forms of innovation and R&D partnership. The 353 companies participating in the 121 R&D alliances we have examined had better performance outcomes (measured by number of patent applications, commercialization of technology, and valuable knowledge generated) when:

- They devoted more technical personnel to the alliance. Companies that sent only one or two experts did not do as well as those that sent four to six. The additional participants improve brainstorming by helping the team see problems from multiple angles.
- They communicated frequently with their partners throughout the R&D process.
- They were strongly satisfied with IP protections—which increased their willingness to share ideas and knowledge more freely.
- The alliance did not include more than four companies, which cut down on coordination costs and free-riding.
- They did not have a competitor in the alliance (although those that did have one performed much better if they also had a university partner—presumably because the latter supplies more useful new knowledge than a competitor does).
- They pursued ambitious projects, which seem to create more excitement among players and thus attract higher-

Early results are impressive. For example, Cisco estimates that the Airbus-DHL-Caterpillar lab produced internal projects, spinouts, and joint ventures to digitize supply chains, factories, and warehouses that will generate $6 billion in new revenue and save $3.4 billion in costs over the next 10 years. Not all projects survive to fruition, but something much more important is happening: Participants are developing new innovation capabilities at the ecosystem level. Markus Durstewitz, the head of corporate innovation at Airbus, told us, "We are convinced that these big changes can only be managed and put into place by the right partners. The ecosystem innovation process was a big opportunity to show us a new way to collaborate."

In this article we discuss how large companies can develop their own ecosystem innovation capabilities, using Cisco's process as a model. We combined insights from Kate O'Keeffe, a coauthor and the chief architect of CHILL, with those gained from dozens of interviews with participants and senior executives from the organizations involved, and interpreted those insights through the lens of our research on innovation methods, R&D alliances, and learning networks. We will describe the basic principles and the process, identify the most common traps, and explain how leaders can capture valuable opportunities—the ecosystem innovations at the core of a digital age.

How to Lead Ecosystem Innovation

skilled participants and greater financial commitment.

Finally, we found that the company initiating the alliance achieves better performance outcomes than do companies that are invited to participate. We believe this is because the leader's key players have a clearer vision of how the alliance can create value, are more committed to the project, and therefore are more likely to commit resources, both human and financial.

If you think collaborating effectively with one partner is a challenge, imagine doing it with four at once—each one an enormous organization with its own distinct culture and objectives. Overcoming these challenges requires leadership, and for ecosystem innovation involving Cisco, the CHILL team leads and facilitates the entire process. It coordinates the ecosystem and the application of tools and methods drawn from design thinking, lean start-up, and business model innovation methodologies. The process has four phases, which run over several months.

1. Identify the "focus zones" and innovation partners.

First the host company identifies the arenas of opportunity, or focus zones, that are important to its own strategy. Cisco recently identified health care—in particular, the digital transformation of health care—as a major growth area. However, the company's leaders realized that to capture the most valuable opportunities, they would need to draw on partners' capabilities to create ecosystem-level solutions. So the CHILL team evaluated the best way to apply its methodology to the digital health care ecosystem. Specific problems to be addressed in the focus zone emerged later, in consultation with ecosystem participants.

Innovation Opportunities in Health Care

In September 2015 Cisco convened a Living Lab in San Francisco focused on "driving technology innovation that will improve patient experiences in cancer care." Participants included UCSF, Community Healthcare Network, Walgreens, and Vocera (a provider of health care communications systems).

The CHILL team uses a scorecard to assess potential partners along three dimensions: maturity in innovation capability; a well-developed internal innovation process; and experience partnering with other companies, working with start-ups, or investing in start-ups. It selects partners on the basis of alignment of goals, market power, and resources. Participants needn't be in the same industry (in fact, more radical and diverse ideas come when they're not), but they should all have a connection to the host, or to one another, that is relevant to the ecosystem innovation effort. For example,

Opportunity Area: Care Coordination

If all the entities involved in care could easily talk to one another, they could have a complete picture of the patient.

PATIENT BENEFITS	ECOSYSTEM BENEFITS	TECH BUILDING BLOCKS
Remove coordination burden	Speed up treatment cycles	Telepresence
Reduce paperwork	Avoid medical errors	Health Information Exchange
Reduce unforeseen complications	Reduce providers' administrative time	EMRs
		Cloud services

" We have a huge stack of paperwork. We don't know what we're looking at—there are no crib notes. Each time we go to [the hospital], we need separate luggage for it."
—MELANOMA PATIENT

the Berlin lab explored a subject that would benefit every participant: how to create an adaptive supply chain—one that responds nimbly to sudden changes—through digitized systems and tools. Although the companies had not worked together in the past, they were eager to gain new knowledge and bring their respective insights and resources to bear on the challenge.

The CHILL team also looks for partners that are willing to send senior executives, receive feedback from end users, and commit resources. Those executives should have top-level knowledge about organizational goals and industry challenges, experience with the innovation process or a formal innovation role at the company, and decision-making authority and resources to allocate to new projects. This is important because large organizations can be agonizingly bureaucratic, destroying the momentum of innovation, whereas CHILL's start-up-like speed requires individual participants with passion and clout. At the end of the Berlin lab, John Kern, the SVP of supply chain operations at Cisco, and Scott Allison, the global sector head for technology at DHL, turned to each other after presenting their team's work (which also involved executives from Caterpillar and Airbus) and essentially said, "Let's do this"—an on-the-spot commitment that put the funding in place and led to the launch of the open-data platform project just a few months later.

Cisco's senior corporate counsel, Jonathan Elstein, put together a simple two-page agreement to ensure that all participants can benefit from their work without a lot of legal wrangling. "Basically, no one has claims over prior IP, and there is free use of what is created in the session," Elstein says. "If we get involved early—talking to the other lawyers, describing the process—we can usually get over the hurdles." Participants understand that should they decide to launch an idea, ownership will be in proportion to the human capital, IP, and financial investments that each made.

2. Find and define the problem.

A successful ecosystem innovation effort includes a robust problem discovery and definition phase. CHILL team members spend three months preparing. They talk to dozens of ecosystem cohort executives, along with experts, customers, and end users, to understand the real problems customers face and identify those that offer the biggest opportunities for the participating companies. After multiple rounds of conversations, the team eventually zeroes in on a single problem to be attacked. The final challenge statement (or "ambition," as CHILL calls it) connects Cisco's strategy with those of its partners in the ecosystem.

Opportunity Area: Virtual Care

If patients and providers could connect remotely 24/7, we could avoid unnecessary hospitalizations.

PATIENT BENEFITS	ECOSYSTEM BENEFITS	TECH BUILDING BLOCKS
Access care during off-hours	Reduce clinic visits and readmissions	Data encryption
Reduce self-monitoring required	Prevent treatment interruptions	Telemedicine
Receive proactive interventions	Acquire reliable patient data	Connected devices
		Predictive analytics

"When I called the surgery hotline, they just didn't understand. I thought, If you could just see me. *If you could see how much pain I am in, you would understand how severe this is.*"

—BREAST CANCER PATIENT

Once the root causes of the problem are thoroughly understood, the CHILL team defines a series of opportunity areas: specific, narrow challenges—based on real issues facing participants and customers—to be addressed during phase 3. For example, one opportunity area for the supply chain lab in Berlin was labeled "adaptive delivery" and tasked participants with creating "a revolutionary adaptive delivery tool that empowers sellers to forecast an order and reroute finished products on the basis of immediate customer needs."

3. Convene the participants to prototype solutions.

The most visible part of CHILL's ecosystem innovation process is the Living Lab, a two-day event that embraces a design thinking and lean start-up approach. At the core of that approach are rapid cycles wherein teams build a simple prototype, use it to test their "leap of faith" assumptions with customers, and then apply the learning from that test to restart the build-test-learn loop.

At a CHILL lab, executives from each of the organizations are grouped into teams of four or five. The teams repeatedly cycle through hypothesis development, prototyping, and testing with customers. Each team conducts five cycles over the two days.

Lab participants can benefit from their work without a lot of legal wrangling.

In each cycle a team typically spends 30 minutes outlining solution ideas and hypotheses, 30 minutes developing and building a solution prototype, and 30 minutes showing the prototype to end users and getting feedback. When CEOs and end users talk directly about a solution, the impact is tremendous. David Ward, Cisco's CTO of engineering and chief architect, calls this approach "speed innovating" and says, "This is the polar opposite of R&D. It's built around what people *don't* know, rather than the common factors we do know."

Early prototypes are simple drawings, storyboards, cardboard cutouts, or other rough representations. Later prototypes are physical mockups or digital interfaces, created with the assistance of an experienced prototype team composed of engineers, hackers, and coders. At the end of a Living Lab, teams demonstrate their prototypes in a final pitch to determine whether to continue beyond the lab. In Berlin, teams demonstrated mocked-up factory processes and crude working wearables.

CHILL strives to create an environment and a tone that will elicit creativity and cooperation. When participants first walked into the beer factory in Berlin, for example, they saw a brightly lit stage with monitors and artwork all around. Designers from Territory, a London design studio, were on hand to display the motion graphics they'd created for the movie *The Martian*—a demonstration meant to inspire the participants.

Morning sessions begin with mindfulness exercises to focus participants' attention, followed by talks with successful innovators such as Tom Chi, one of the creators of Google Glass. Chi took the stage in Berlin, declared that anything could be prototyped in seconds, and dared the participants to throw out a challenge. One suggested an "Airbnb for warehouses"—a service offering temporary storage for businesses with extra inventory. Chi proceeded to role-play how the service might function, working through the process of dropping off merchandise at a hired warehouse space and uncovering such unexpected challenges as how to handle goods that were damaged en route. He used a marker and paper to mock up the online customer interface, unearthing the key pieces of information that customers would need in order to make a purchase decision, such as price, available space, location, and user reviews. Participants saw that they

could use prototypes to move at a faster pace than they had ever thought possible. They also saw that even the roughest prototype can be an extremely valuable tool for uncovering and testing key assumptions.

The CHILL team brings along a guide, a designer, a historian, a builder, and a hacker for each team of participants. The guide acts as a coach, answering initial questions about the process and helping the team stay focused on hypothesis generation and prototyping. The designer helps capture the conversation visually. The historian documents key hypotheses and insights generated from customer testing. The builder and the hacker listen to the team's solutions as they evolve; then, after dinner, they stay up all night working with the designer to assemble solution prototypes. When participants return in the morning and find the backbone of a physical or a software prototype, it both creates positive momentum that powers the second day and provides the raw material for a pitch that afternoon.

Opportunity Area: Connected Hospitals

If hospital assets were connected and trackable, care teams could keep tabs on people and things from anywhere.

PATIENT BENEFITS	ECOSYSTEM BENEFITS	TECH BUILDING BLOCKS
Smooth in-patient experiences	Reclaim wasted staff time	IoT devices
Reduce wait time	Minimize equipment downtime	Mobile apps
Give more-attentive care	Improve asset scheduling	Predictive analytics
		Networking

" In health care there is a huge 'low-hanging fruit' opportunity to transform the patient experience just by applying what already exists for other industries

The communal meal at the end of the first day plays an important catalytic role. There we've heard participants challenge their deepest assumptions about their solution. They ask themselves whether they are truly tackling big, hairy problems worthy of their time and whether their prototype meets the real user need. Such reflection after a full day causes many teams to pivot to a new framing of the problem or a new solution to prototype. Three of the Berlin teams did just that—threw out their prototypes and ideas and decided to create something totally new. Such pivots are an important part of the process.

4. Achieve commitment and follow-up.

As the second day of a Living Lab reaches its midpoint, the teams start to prepare their presentations for experts and investors—a panel composed of senior Cisco executives and executives from the participating organizations. The CHILL team also brings in business analysts to help the teams think through the business model and the "value at stake," a metric Cisco defines as value that could be created (new revenue) or

costs that could be saved by the innovation. For example, when the teams at the retail Living Lab mentioned above (Nike, Costco, Visa, and Lowe's), held in San Francisco, designed a personalized experience in the form of a locker that was stocked with potential purchases and recommendations (and unlocked by an app), the value at stake was estimated at $432 million a year in additional revenue—an 8% increase. This metric roughly describes the potential of a project in a language that the rest of an organization can understand.

After the teams present their innovations, executives who want to invest in one, including the panel "judging" the event, must commit on the spot. The goal is to get an instant decision and "timebox" the innovation cycle, which otherwise might run on and on. This also creates excitement that is vital to the future success of the project.

In the final stages of the process, the CHILL team spends two weeks assembling a "build archetype," which includes (1) all the content, customer feedback, and insights generated during the session; (2) the physical architecture or code developed in making the prototype; (3) a business model; and (4) a plan of action for the next six months, agreed to by participants who committed during the wrap-up.

> Executives must commit on the spot, creating excitement that is vital to success.

CHILL meets with all the attendees immediately after a lab, but it is up to them to take the next step. That might involve all the members of a Living Lab group, a subset of the group, or a separate start-up overseen by the member companies. Usually only two or three companies commit to moving a project to the next stage. Although CHILL does try to ensure that the group convenes its initial meetings and creates a plan to move forward, the participating executives are ultimately responsible for crafting a development agreement—usually a surprisingly straightforward step. "The parties already have experience working together during the Living Lab," says Elstein. "They have forged a relationship and know they can create value together."

Opportunity Area: Medication Management

Ecosystem Innovation Results

It might be tempting to measure the results of ecosystem innovation in dollars alone, but these are early days, and many projects have not yet

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Smooth in-patient experiences	Reclaim wasted staff time	IoT devices
Reduce wait time	Minimize equipment downtime	Mobile apps
Give more-attentive care	Improve asset scheduling	Predictive analytics
		Networking

" In health care there is a huge 'low-hanging fruit' opportunity to transform the patient experience just by applying what already exists for other industries, such as retail and transportation."
—MEDICAL ONCOLOGIST

been commercialized. According to participants, however, the value of the process goes far beyond additional revenue.

Every experiment produces three types of value: launch, strategic, and exit. *Launch value* is the profit, revenue, or enhanced reputation from commercializing an innovation. So far, about 75% of CHILL innovations have been funded and are advancing to commercialization as internal projects, joint ventures, or spun-out start-ups. Cisco estimates that the retail lab projects will reap $4.5 billion in additional revenue if they are commercialized and that the five ideas developed in the supply chain lab will generate $6 billion in additional revenue. Even if these innovations realize only half their potential, the value will be substantial.

Strategic value is derived from the connections participants make with one another and from future collaborations. Participants repeatedly told us about seeing new opportunities to work with partners they would not previously have considered. In fact, the CHILL team estimates that for every partnership formed during the Living Lab in Berlin, three more were generated afterward as a direct result of the relationships created during the process.

Exit value is knowledge, components, or solutions that are not commercialized immediately but can be tapped by participants in the future. Almost every participant we interviewed spoke effusively about customer knowledge, problem definition, process insights, or other benefits they derived. Kern notes that Cisco used the Berlin experience to create a network of innovation catalysts inside its own supply chain organization. Many others told us that their participation helped make their large organizations more agile and ready to embrace greater risk, because the process decreased the costs of doing so.

CONCLUSION

Ecosystem innovation is not a panacea, but it is one answer to the challenge of finding new ways to grow profits. Not every project developed this way succeeds: Some of them are too ambitious, some aren't ambitious enough, some run up against cultural blocks, and some simply fail. But the process allows companies to bring extremely diverse ideas, skills, and resources together to solve ecosystem-level problems at astonishing speed. It also helps them build the innovation capabilities needed for a digital age and the collaboration skills to capture the valuable opportunities that sit at the intersection of products, companies, and industries.

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