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LEADING TEAMS

Wicked-Problem Solvers

by Amy C. Edmondson

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Companies have long cooperated within their ecosystems, working with suppliers, partners, customers, and even competitors. But as the premium on innovating grows, especially for wicked problems—those with incomplete, contradictory, or changing requirements—more organizations are tapping the capabilities of new and far-flung partners. That such cross-industry collaborations can generate radical innovations is clear. How to build and run them is another matter.

The challenge arises from the broad mix of expertise common on cross-industry teams. Participants often live in different intellectual worlds and have distinct technical languages. The gulfs between behavioral norms and values across industries and professions can be even wider. Within an industry, for example, people commonly share assumptions about the mission, how people at different levels should interact, the quality needed at various project stages, and so on. These assumptions shape behavior in subtle ways—and deviations, by definition, feel off. Thus when cross-industry teams come together, they often suffer from culture clash. A digital start-up

in Germany and a large health care provider in the United States will have very different cultures—but if the companies are going to innovate together, they'll need to get on the same page.

The parable of the learned blind men encountering an elephant captures the essence of the cross-industry challenge. Each man reaches a different conclusion about the elephant on the basis of his observation of a single part of it. The problem, as poet John Godfrey Saxe explained, is that "each was partly in the right, and all were in the wrong!" In the same way, people on cross-industry teams frequently spiral into perplexed and emotionally charged disagreement, unable to see value beyond their limited field of view. The role of leaders is to enable diverse team members to grasp one another's perspectives and productively share their insights.

To understand why some leaders achieve this—and why some don't—my colleagues and I conducted research on more than a dozen cross-industry innovation projects, among them the creation of a new city, a mango supply-chain transformation, and the design and construction of two leading-edge buildings. Some projects were extraordinarily successful; others weren't.

One of the notable successes was the Lake Nona Medical City project. Launched in 1999, it had a compelling vision: transform 7,000 undeveloped acres in central Florida into a thriving sustainable city focused on health care innovation. The city would encompass a 650-acre R&D campus with LEED-certified research buildings as an economic anchor, a brand-new medical school, and a new VA hospital. It would also feature energy-efficient homes, LED streetlights, shops, restaurants, and more in the surrounding community. Scientists, physicians, businesspeople, and technologists would converge on Lake Nona to take and create new jobs, live in state-of-the-art homes, and pursue innovation in everything from basic science to care delivery.

The project, developed by Tavistock Group, an international private investment firm, was highly ambitious. To help meet its aggressive timetable—about a decade—Tavistock created an autonomous organization called Lake Nona Institute to manage the technical and interpersonal challenges that the collaboration of planners, architects, real estate developers, education and government leaders, health care institutions, and corporate partners would entail. Today, Lake Nona is up and running, with hundreds of homes, a growing population, and a thriving R&D hub—itself a center of cross-industry teaming among anchor institutions. Ten projects are under way this year.

How did Lake Nona Institute do it? Like all the successful projects we studied, the initiative was guided by four key practices: fostering an adaptable vision, enabling psychological safety, facilitating the sharing of expertise, and promoting execution-as-learning. These broad practices will be familiar to any student of teams, but their application in cross-industry settings presents unique challenges and solutions, as we shall see.

Leaders must manage the tension between clarity of purpose and potentially shifting goals.

Though the practices are presented here in sequence, in reality they are not isolated activities that are executed and then completed. Rather, they evolve as leaders cycle through them, continually optimizing each, using experience from one to inform another. For example, learning from project execution often leads to modification of the starting vision. Let's look at each practice in turn.

1. Foster an Adaptable Vision

Project leaders know that a compelling vision motivates team members to work hard and collaborate. The conventional wisdom has been that an unwavering vision is needed to keep people inspired and on track; if the team's purpose constantly shifts, the thinking goes, members can become cynical and demoralized. And this is often true for stable, long-term teams that have a well-defined output. But in cross-industry teaming, where innovation projects are complex, dynamic, and uncertain, the vision must be deliberately designed to evolve, for three reasons: First, a team's capabilities are often unclear at the outset. As members' expertise is integrated, new possibilities come into focus. Second, an adaptable vision provides room for diverse participants to shape it early on and influence it as the work unfolds, both of which are essential to maintaining engagement. And finally, as these novel projects get under way, end users' needs may change.

This creates a particular challenge for leaders, who must thoughtfully manage the tension between clarity of purpose and potentially shifting goals. They must be clear about the project's underlying values and then explain, invite input into, and celebrate the evolving vision.

Make project values explicit.

While project vision may shift, the motivating values underlying it—its supporting principles—serve as unchanging bedrock. Across the projects we studied, successful leaders went to great lengths to convey to participants the importance of the endeavor—often framed in terms of personal, social, or environmental values—and what was at stake.

Consider the rescue of the 33 Chilean miners trapped in a mine collapse in 2010. Over an excruciating 70 days, experts from an array of occupations, organizations, and industries teamed up to solve an exceedingly challenging technical problem. The starting vision articulated by the team leaders—to bring the miners home alive—was explicitly framed so that it could shift, if necessary, to a different one: returning the bodies to their families. While the project vision was designed to evolve, the underlying project values—commitment, compassion, and radical innovativeness—never wavered. Despite lengthening odds against success, André Sougarret, the rescue leader, often highlighted the team's purpose—saving lives—while preparing participants for the potential for a new purpose that, in its own way, would be just as important.

The hazards of failing to prepare teams for an evolving vision—and failing to leverage shared values to support a shift—is evident in the experience of software start-up Living PlanIT, which led a five-year smart-city project in Portugal. The glue that held Living PlanIT together had long been the company's founding vision. The prospect of a gleaming, green, high-tech experimental city was personally motivating to participants from diverse industry backgrounds, ranging from software to real estate development to city government. Their enthusiasm for the project's unique combination of technical innovation and bold demonstration of new possibilities brought people together and gave them, for all their differences, a shared identity.

But over time, the complexity of agreeing on a master plan, let alone building a city, came into sharp relief. As project leaders learned more about what was doable and what was not, the vision morphed. The new vision—to develop and globally distribute smart city software—was not readily embraced by all. Although it was potentially just as motivating, leadership had not prepared team members for this possibility or communicated clearly how the new vision aligned with the project's values. The lack of explicit discussion about why and how the mission had to change created a wedge between participants. Reminding team members about the values underlying the project—promoting sustainability, urban livability, innovation—could have helped bring all of them back into the fold. Instead, the team found itself split between those enthusiastic about the new goal and those who clung to the old one.

Invite input and celebrate change.

As the Living PlanIT experience shows, it's critical to engage team members from diverse industries in developing and reshaping a project vision. This means forcefully and sincerely inviting input from all players.

Leaders on the Lake Nona Medical City project, for example, began by explicitly communicating the project vision to potential partners. Then, rather than spelling out a specific plan for how each team member would participate, leaders launched a conversation about possibilities and how the various partners might enrich and alter the vision. The more the participants talked, the more the vision evolved. For example, an element that today is central to the Lake Nona vision—the inclusion of a large-scale health study of the residential community—emerged after Johnson & Johnson joined the project and spurred discussion about the idea among partners.

Likewise, leaders must go beyond simply preparing participants for change and actively celebrate it. In any uncertain and risky endeavor—particularly when people come from different organizational cultures and have widely different expertise—change can be confusing. If it's not acknowledged by everyone as positive, it can lead to finger-pointing. Thus leaders need to fully explain the rationale for change, give "permission" for open discussion about it, and actively embrace and champion it. After Lake Nona participants proposed doing the residential health study, for example, institute and Tavistock leaders actively supported the plans to carry out the research.

2. Promote Psychological Safety

Much has been written about the importance of creating team environments in which it's "safe" to volunteer crazy ideas, admit errors, and openly disagree without fear of ridicule or punishment. To create a climate that invites people to speak up, leaders commonly model the desired behaviors—being curious, acknowledging uncertainty, highlighting their own fallibility. These and other tactics that promote psychological safety are particularly important for cross-industry innovation teams for several reasons. First, people often fear exposing their ignorance in front of experts from a different domain. What is obvious to people in one field may be mysterious to those in another, increasing the chances that a reasonable question will come across as a stupid one.

And second, team members may hold stereotyped views of colleagues in other domains and thus feel inhibited about directly addressing an issue. On one project, for example, members of a

software start-up viewed their counterparts in the real estate industry as stuck in the past and greedy; meanwhile, the real estate professionals viewed the software types as flighty and unrealistic. The cultural divide made it hard for either side to speak openly. It rarely occurred to people to reexamine their own views or to approach one another with curiosity rather than fixed assumptions.

Leading Across Boundaries

Four leadership levers help managers effectively employ the key practices of cross-industry collaboration. As teams cycle through the practices, they apply knowledge gained at each step to inform the next.

LEADERSHIP LEVERS	TECHNICAL Focus on systems for interaction	PSYCHOLOGICAL Focus on emotions
MOTIVATIONAL Channel energy	4. Encourage collaborative iteration Support test-and-learn approaches and invite debate on project requirements	1. Foster an adaptable vision Appeal to personal values, invite input on the vision, and celebrate change
ENABLING Remove barriers	3. Enable knowledge sharing Align professional values and colocate experts	2. Promote psychological safety Give permission for risk taking and encourage social bonding

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To guard against anxiety about missteps and to foster inquisitiveness, leaders in successful projects emphasize the novel nature of the work, clarify the protective legal context, and frame the teams' diverse expertise and professional cultures as rich resources to mine together.

Acknowledge the experiment.

Pointing out that the work ahead is experimental creates an expectation that risk taking, both interpersonal and technical, is essential. When people understand this context, they are more likely to approach their collaborators with open-minded curiosity and feel less concerned about committing social blunders or exposing their ignorance.

When IT services giant Fujitsu identified the "maker movement"—the rise of DIY as an alternative to purchasing goods and an opportunity for end-user innovation—as a potential new market, it teamed up with TechShop, a chain of makerspaces that offer individuals access to

professional equipment, software, and other materials. Project leaders invited team members to imagine opportunities for collaboration that neither organization would be likely to conceive of on its own. Further, they emphasized that the success of participants' experiments would be gauged by their novelty and potential rather than by immediate business results. Empowered to think creatively and make mistakes, team members volunteered some risky ideas, among them a mobile makerspace that would bring design and prototyping technologies into schools. The result was TechShop Inside!, a 24-foot trailer equipped with Fujitsu computer tools for 3-D printing, laser cutting, CAD design, and welding that visits schools throughout the San Francisco Bay Area to foster STEAM (science, technology, engineering, arts, and math) education.

Reduce legal concerns.

To build a safe environment, it sometimes helps to clarify the project's legal context. One of the cross-industry projects we studied was the creation of Autodesk's Boston headquarters, a groundbreaking LEED-certified building. The project involved a typically diverse array of participants—architects, general contractors, building engineers, sustainability consultants, and so on. To align participants' interests and foster collaboration from the outset, Autodesk used an approach called Integrated Project Delivery. IPD is a contractual agreement among participants to share all project risks and profits—in direct contrast to industry norms whereby cross-industry tensions (particularly between design and construction) are deeply entrenched. Under IPD, participants work as a cohesive team to improve efficiency and cost, though they have different employers.

Collaborators on the Autodesk project pointed to the IPD arrangement as an important enabler of success. In particular, the contract terms, which prohibited litigation except in cases of negligence, changed the tone. Because of the high cost of construction errors, finger-pointing and lawsuits among cross-industry players are not uncommon. With the IPD contract in place, participants had to figure out ways to see one another as trusted creative partners rather than potential litigants—a mindset reinforced by team leaders.

Fujitsu learned the hard way about the value of creating an enabling legal environment in advance. An early cross-industry innovation attempt was terminated by company lawyers who were concerned about the potential threat to company intellectual property. A second attempt succeeded after Fujitsu managers teamed up with legal early on to create collaboration terms that promoted knowledge sharing while protecting IP.

Encourage social bonding.

In projects where interindustry trust is low, new innovation teams typically begin with a negative balance of it. That's why it's important for leaders to explicitly cast the diverse expertise among participants as a source of solutions rather than of conflict. One initiative, a 1,500-acre greenfield city project in Korea called New Songdo, used a "charrette"—a collaboration process that is increasingly applied in innovative design projects. The charrette brought together 60 architects, engineers, planners, and environmental experts at the outset to integrate their expertise. To encourage social bonding, the weeklong charrette started with a dinner and informal socializing the night before formal presentations. As the charrette got under way, experts gave short technical presentations, and clients talked about project goals and challenges. Discussion then turned to what additional expertise might be needed. Brainstorming sessions followed to generate innovative ideas and strengthen commitment and trust.

3. Enable Knowledge Sharing

The insights that come from deep understanding of an industry often seem so obvious to experts that it may not occur to them to explain their reasoning. This creates misunderstanding and conflict. Project leaders should insist that participants share their thought processes, and should help them do so. Of course, holding meetings to create shared understanding takes time and may seem wasteful. It's tempting to simply get down to work and assume that if each group does its part, the project will succeed. Yet up-front investments in cross-domain learning can prevent problems ranging from small delays to major failures.

As the New Songdo charrette showed, knowledge sharing starts in the first days of a project, as relationships begin to form. But it isn't a onetime activity, nor is it simply a mechanical process of, say, scheduling routine meetings and providing communication tools such as digital platforms. Leaders must also align their teams around professional values and encourage face-to-face interaction.

Emphasize professional values.

As discussed, clarifying project values is central to building the cohesion that helps cross-industry teams weather a project's shifting goals. Likewise, cross-industry project leaders must surface the professional values that characterize different disciplines and find the common ground among them.

The challenge is to frame people's differences

as a source of strength for the team.

Builders, for instance, typically place a high value on reliability and getting it right the first time; software developers favor experimentation and speed to market. My research shows that clashing professional values like these can undermine cross-industry projects. Consider what happened at Living PlanIT. Because leadership failed to explicitly surface industry values, participants from different industry groups found themselves blaming one another for the project's slow progress. Software engineers bemoaned the risk-averse behavior of those in government and construction, while those in real estate and construction focused on the engineers' unrealistic time frames, and so on.

Exposing distinct professional values is an important starting point, but the further challenge is to frame those differences as a source of strength or advantage for the team. Exploring with building engineers and software developers ways that they might achieve experimentation and reliability simultaneously, for example, can spur knowledge sharing—and improve mutual understanding.

Force face-to-face interaction.

Left to their own devices, most people will incline toward others in their own business. A real-estate finance professional is not going to naturally sit down with a software developer to share insights. Such connections become even harder to build across geographic, language, and national boundaries. One way to overcome these obstacles is to encourage face-to-face interaction among team members. The stunning translucent structure that hosted swimming and diving events at the 2008 Olympics in Beijing—the so-called Water Cube—is a testament to such cross-boundary communication.

Created by a consortium of firms teaming across continents (including global engineering firm Arup and PTW Architects, both based in Sydney, and China Construction Design International in Shanghai), the project won awards for structural, aesthetic, and environmental achievements. To bridge the distances (professional and otherwise), the firms colocated bilingual specialists across office sites. The exchange enabled the facetime necessary to overcome language barriers and to bridge deep cultural divides between Australian and Chinese professionals. In a meeting to brainstorm acoustical solutions to sound's bouncing off the cube's expanses of glass, for example, a team of architects and engineers from several disciplines (materials, structure, fire safety, and acoustics) came up with the solution of using a novel space-industry material that

had never before been applied in a major building project.

The Autodesk project leaders similarly used colocation to help build relationships and facilitate knowledge sharing—in radical contrast to the antagonism that usually existed between design and construction. During the design process, for example, a construction manager relocated to the design office; during construction, an architect relocated to the building site. The close proximity helped people understand one another's challenges and the rationale for their solutions. As one architect on the team put it, "Colocating, you spend so much time together that you begin to see how others see things."

4. Foster Execution-as-Learning

On any complex project, it's tempting to fall back on a blueprint approach to project management, because it works so well when tasks and interdependencies among players are well specified. It can be effective even for extremely complex projects in which established teams traverse relatively familiar territory. But it's a recipe for disaster on cross-industry innovation projects. That's because there is no blueprint to follow. In those circumstances, the best leaders embrace an execution-as-learning mindset that puts a premium on experimentation.

Test and learn.

Consider Haiti Hope, a successful initiative to improve Haitian mango farmers' business practices and income. The project leader, from the nonprofit organization TechnoServe, brought together experts in agriculture, economic development, finance, marketing, and supply chain management. Together, they came up with a strategy for disseminating new agricultural practices and business approaches among local cooperatives of mango farmers. But as the project unfolded, it became clear that leaders of the cooperatives—which are something like unions—were less interested in training farmers than in absorbing aid payouts. They were also unwilling to pass along to farmers profits from the improved export deals brokered by Haiti Hope.

Learning from this strategy test, project leaders devised a novel structure called producer business groups, or PBGs, which were unconnected to the cooperatives. To head off the problems they'd had with cooperatives, project leaders worked closely with the farmers to limit the size of each PBG and build a shared governance structure that would promote engagement and reduce corruption. Soon the PBGs had enrolled more than 10% of Haiti's mango farmers in a test of the new structure, with positive impacts on revenues, profits, product quality, and

exports.

As the Haiti Hope initiative shows, at certain points in the process, big ideas (alleviate poverty through better business approaches) must be followed by small action (provide business training to individuals on the ground). Experiments must be narrow and deliberate, to gain insight about what works in unfamiliar territory.

Welcome "arguable" changes.

Any cross-industry project is going to encounter scope changes. During the Autodesk headquarters project, VP Phil Bernstein, himself an architect, offered this typology: avoidable, unforeseeable, and arguable. Avoidable scope changes result from inadequate sharing or poor planning; unforeseeable changes are new requirements that emerge as a project unfolds and more is learned; arguable changes—also emergent—are the result of new, debate-worthy preferences that surface unexpectedly.

The Autodesk project encountered plenty of unforeseeable changes and one major arguable one. With design and construction plans all but finished, project participants, led by Bernstein, reflected on what they had produced. It seemed good. Viable. But something was missing. Seeking a "spark," the cross-industry team spent five days brainstorming and reworking the building concept until it landed on the idea of a dramatic atrium and center staircase. The design seemed compelling on paper but would be more expensive. Torn between the competing interests of costs and aesthetics, the team was stuck. Then the group came up with the idea of creating a 3-D model of the project (novel technology at the time) to allow all stakeholders to viscerally experience the new space, viewing it from every perspective. When the rendering was complete and people could engage virtually with the design, everyone agreed that it would be worth the cost, and a unanimous decision to proceed quickly followed.

Although design and construction projects have always involved multiple industries, real-time, face-to-face teaming like this is extremely rare. As a result, test-and-learn approaches are usually cumbersome and time consuming. According to Bernstein, the five days of work to redesign the project would have taken five weeks without the cross-industry teaming. Ultimately, the new headquarters was completed a month early and under (the new) budget. Perhaps most important, Autodesk employees loved the new building.

The most audacious innovations—like developing a smart, green, livable city—simply cannot be

created by single companies or by industries operating alone. But even on smaller-scale projects, leaders increasingly find themselves operating in complex business ecosystems where cross-industry teaming is necessary to innovation. To succeed in this world, they must strike a difficult balance: They need to advance their vision by looking beyond their own industry perspective and engaging a host of potentially antagonistic experts with distinct industry mindsets. They must be flexible, open-minded, and humble on the one hand and filled with fierce resolve on the other. Leading this way is challenging, but it's a learnable skill, and as cross-industry teaming becomes the norm, it is one that no leader or firm can afford to ignore.

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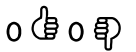
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