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Imagine an organization that confronts constantly changing competitors. That is always smaller and less well-equipped than its opponents. That routinely cuts its manpower and resources. That turns over a third of its leaders every year. And that still manages to win competition after competition after competition.

The U.S. Army's Opposing Force (commonly known as OPFOR), a 2,500-member brigade whose job is to help prepare soldiers for combat, is just such an organization. Created to be the meanest, toughest foe troops will ever face, OPFOR engages units-in-training in a variety of mock campaigns under a wide range of conditions. Every month, a fresh brigade of more than 4,000 soldiers takes on this standing enemy, which, depending on the scenario, may play the role of a hostile army or insurgents, paramilitary units, or terrorists. The two sides battle on foot, in tanks, and in helicopters dodging artillery, land mines, and chemical weapons.

Stationed on a vast, isolated stretch of California desert, OPFOR has the home-court advantage. But the force that's being trained—called Blue Force, or BLUFOR, for the duration of the exercise—is numerically and technologically superior. It possesses more dedicated resources and better, more rapidly available data. It is made up of experienced soldiers. And it knows just what to expect, because OPFOR shares its methods from previous campaigns with BLUFOR's commanders. In short, each of these very capable BLUFOR brigades is given practically every edge. Yet OPFOR almost always wins.

Underlying OPFOR's consistent success is the way it uses the *after-action review* (AAR), a method for extracting lessons from one event or project and applying them to others. The AAR, which has evolved over the past two decades, originated at OPFOR's parent organization, the National Training Center (NTC). AAR meetings became a popular business tool after Shell Oil began experimenting with them in 1998 at the suggestion of board member Gordon Sullivan, a retired general. Teams at such companies as Colgate-Palmolive, DTE Energy, Harley-Davidson, and J.M. Huber use these re-

views to identify both best practices (which they want to spread) and mistakes (which they don't want to repeat).

Most corporate AARs, however, are faint echoes of the rigorous reviews OPFOR performs. It is simply too easy for companies to turn the process into a pro forma wrap-up. All too often, scrapped projects, poor investments, and failed safety measures end up repeating themselves. Efficient shortcuts, smart solutions, and sound strategies don't.

For companies that want to transform their AARs from postmortems of past failure into aids for future success, there is no better teacher than the technique's master practitioner. OPFOR treats every action as an opportunity for learning—about what to do but also, more important, about how to think. Instead of producing static "knowledge assets" to file away in a management report or repository, OPFOR's AARs generate raw material that the brigade feeds back into the execution cycle. And while OPFOR's reviews extract numerous lessons, the group does not consider a lesson to be truly learned until it is successfully applied and validated.

The battlefield of troops, tanks, and tear gas is very different from the battlefield of products, prices, and profits. But companies that adapt OPFOR's principles to their own practices will be able to integrate leadership, learning, and execution to gain rapid and sustained competitive advantage.

Why Companies Don't Learn

An appreciation of what OPFOR does right begins with an understanding of what businesses do wrong. To see why even organizations that focus on learning often repeat mistakes, we analyzed the AAR and similar "lessons learned" processes at more than a dozen corporations, nonprofits, and government agencies. The fundamentals are essentially the same at each: Following a project or event, team members gather to share insights and identify mistakes and successes. Their conclusions are expected to flow—by formal or informal channels—to other teams and eventually coalesce into best practices and global standards.

Mostly though, that doesn't happen. Although the companies we studied actively look for lessons, few learn them in a meaningful way. One leader at a large manufacturing company told us about an after-action review for a failed project that had already broken down twice before. Having read reports from the earlier attempts' AARs—which consisted primarily of one-on-one interviews—she realized with horror after several grueling hours that the team was "discovering" the same mistakes all over again.

A somewhat different problem cropped up at a telecom company we visited. A team of project managers there conducted rigorous milestone reviews and wrap-up AAR meetings on each of its projects, identifying problems and creating technical fixes to avoid them in future initiatives. But it made no effort to apply what it was learning to actions and decisions taken on its current projects. After several months, the team had so overwhelmed the system with new steps and checks that the process itself began causing delays. Rather than improving learning and performance, the AARs were reducing the team's ability to solve its problems.

We also studied a public agency that was running dozens of similar projects simultaneously. At the end of each project, team leaders were asked to complete a lessons-learned questionnaire about the methods they would or would not use again; what training the team had needed; how well members communicated; and whether the planning had been effective. But the projects ran for years, and memory is less reliable than observation. Consequently, the responses of the few leaders who bothered to fill out the forms were often sweepingly positive—and utterly useless.

Those failures and many more like them stem from three common misconceptions about the nature of an AAR: that it is a meeting, that it is a report, or that it is a postmortem. In fact, an AAR should be more verb than noun—a living, pervasive process that explicitly connects past experience with future action. That is the AAR as it was conceived back in 1981 to help Army leaders adapt quickly in the dynamic, unpredictable situations they were sure to face. And that is the AAR as OPFOR practices it every day.

More than a Meeting

Much of the civilian world's confusion over AARs began because management writers focused only on the AAR meeting itself. OPFOR's AARs, by contrast, are part of a cycle

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that starts before and continues throughout each campaign against BLUFOR. (BLUFOR units conduct AARs as well, but OPFOR has made a fine art of them.) OPFOR's AAR regimen includes brief huddles, extended planning and review sessions, copious note taking by everyone, and the explicit linking of lessons to future actions.

The AAR cycle for each phase of the campaign begins when the senior commander drafts "operational orders." This document consists of four parts: the task (what actions subordinate units must take); the purpose (why the task is important); the commander's intent (what the senior leader is thinking, explained so that subordinates can pursue his goals even if events don't unfold as expected); and the end state (what the desired result is). It might look like this:

> **Task:** "Seize key terrain in the vicinity of Tiefort City…"
>
> **Purpose:** "…so that the main effort can safely pass to the north."
>
> **Commander's Intent:** "I want to find the enemy's strength and place fixing forces there while our assault force maneuvers to his flank to complete the enemy's defeat. The plan calls for that to happen here, but if it doesn't, you leaders have to tell me where the enemy is and which flank is vulnerable."
>
> **End State:** "In the end, I want our forces in control of the key terrain, with all enemy units defeated or cut off from their supplies."

The commander shares these orders with his subordinate commanders—the leaders in charge of infantry, munitions, intelligence, logistics, artillery, air, engineers, and communications. He then asks each for a "brief back"—a verbal description of the unit's understanding of its mission (to ensure everyone is on the same page) and its role. This step builds accountability: "You said it. I heard it." The brief back subsequently guides these leaders as they work out execution plans with their subordinates.

Later that day, or the next morning, the commander's executive officer (his second in command) plans and conducts a rehearsal, which includes every key participant. Most rehearsals take place on a scale model of the battlefield, complete with hills sculpted from sand, spray-painted roads, and placards denoting major landmarks. The rehearsal starts with a restatement of the mission and the senior commander's intent, an intelligence update on enemy positions and strength, and a breakdown of the battle's projected critical phases. Each time the executive officer calls out a phase, the unit leaders step out onto the terrain model to the position they expect to occupy during that part of the action. They state their groups' tasks and purposes within the larger mission, the techniques they will apply in that phase, and the resources they expect to have available. After some discussion about what tactics the enemy might use and how units will communicate and coordinate in the thick of battle, the executive officer calls out the next phase and the process is repeated.

As a result of this disciplined preparation, the action that follows becomes a learning experiment. Each unit within OPFOR has established a clear understanding of what it intends to do and how it plans to do it and has shared that understanding with all other units. The units have individually and collectively made predictions about what will occur, identified challenges that may arise, and built into their plans ways to address those challenges. So when OPFOR acts, it will be executing a plan but also observing and testing that plan. The early meetings and rehearsals produce a testable hypothesis: "In *this* situation, given *this* mission, if we take *this* action, we will accomplish *that* outcome." OPFOR is thus able to select the crucial lessons it wants to learn from

Learning to Be OPFOR

The 11th Armored Cavalry Regiment (ACR), which has played the Opposing Force (OPFOR) for more than a decade, is a brigade of regular U.S. Army soldiers. In the current environment, every Army unit that is deployable has been activated—including the 11th ACR, which is now overseas.

It will return. In the meantime, a National Guard unit that fought side by side with the 11th ACR for ten years has assumed the OPFOR mantle. This new OPFOR faces even greater challenges than the regular brigade did. It is smaller. It comprises not professional soldiers but weekend warriors from such companies as UPS and Nextel. And it recently gave up its home-court advantage and traveled to BLUFOR's home base when that unit-in-training's deployment date was moved up.

Nonetheless, the Army is satisfied that this new OPFOR—now one year into its role—is successfully preparing combat units for deployment to the Middle East. It has managed that, in large part, by leveraging the after-action review (AAR) regimen it learned from the 11th ACR. It is difficult to imagine a more dramatic change than the wholesale replacement of one team by another. That the new OPFOR has met this challenge is powerful evidence of the AAR's efficacy to help an organization learn and adapt quickly.

each action and focus soldiers' attention on them in advance.

Such before-action planning helps establish the agenda for after-action meetings. Conversely, the rigor of the AAR meetings improves the care and precision that go into the before-action planning. As one OPFOR leader explained to us: "We live in an environment where we know we will have an AAR, and we will have to say out loud what worked and what didn't. That leads to asking tough questions during the planning phase or rehearsals so that you know you have it as right as you can get it. No subordinate will let the boss waffle on something for long before challenging him to say it clearly because it will only come out later in the AAR. As a consequence, AAR meetings create a very honest and critical environment well before they begin."

The reference to AAR *meetings*—plural—is important. While a corporate team might conduct one AAR meeting at the end of a six-month project, OPFOR holds dozens of AARs at different levels in a single week. Each unit holds an AAR meeting immediately after each significant phase of an action. If time is short, such meetings may be no more than ten-minute huddles around the hood of a Humvee.

It is common for OPFOR's AARs to be facilitated by the unit leader's executive officer. Virtually all formal AAR meetings begin with a reiteration of the house rules, even if everyone present has already heard them a hundred times: Participate. No thin skins. Leave your stripes at the door. Take notes. Focus on our issues, not the issues of those above us. (The participants' commanders hold their own AARs to address issues at their level.) Absolute candor is critical. To promote a sense of safety, senior leaders stay focused on improving performance, not on placing blame, and are the first to acknowledge their own mistakes.

The AAR leader next launches into a comparison of intended and actual results. She repeats the mission, intent, and expected end state; she then describes the actual end state, along with a brief review of events and any metrics relevant to the objective. For example, if the unit had anticipated that equipment maintenance or logistics would be a challenge, what resources (mines, wire, ammo, vehicles) were functioning and available?

The AAR meeting addresses four questions: What were our intended results? What were our actual results? What caused our results? And what will we sustain or improve? For example:

Sustain: "Continual radio commo checks ensured we could talk with everyone. That became important when BLUFOR took a different route and we needed to reposition many of our forces."

Sustain: "We chose good battle positions. That made it easier to identify friends and foes in infantry."

Improve: "When fighting infantry units, we need to keep better track of the situation so we can attack the infantry before they dismount."

Improve: "How we track infantry. We look for trucks, but we need to look for dismounted soldiers and understand how they'll try to deceive us."

One objective of the AAR, of course, is to determine what worked and what didn't, to help OPFOR refine its ability to predict what will work and what won't in the future. How well did the unit assess its challenges? Were there difficulties it hadn't foreseen? Problems that never materialized? Yes, it is important to correct *things;* but it is more important to correct *thinking*. (OPFOR has determined that flawed assumptions are the most common cause of flawed execution.) Technical corrections affect only the problem that is fixed. A thought-process correction—that is to say, learning—affects the unit's ability to plan, adapt, and succeed in future battles.

More than a Report

At most civilian organizations we studied, teams view the AAR chiefly as a tool for capturing lessons and disseminating them to other teams. Companies that treat AARs this way sometimes even translate the acronym as after-action report instead of after-action review, suggesting that the objective is to create a document intended for other audiences. Lacking a personal stake, team members may participate only because they've been told to or out of loyalty to the company. Members don't expect to learn something useful themselves, so usually they don't.

OPFOR's AARs, by contrast, focus on improving a unit's own learning and, as a result, its own performance. A unit may generate a lesson during the AAR process, but by OPFOR's definition, it won't have learned that lesson until its members have changed their be-

OPFOR treats every action as an opportunity for learning—about what to do but also, more important, about how to think.

havior in response. Furthermore, soldiers need to see that it actually works. OPFOR's leaders know most lessons that surface during the first go-round are incomplete or plain wrong, representing what the unit thinks should work and not what really does work. They understand that it takes multiple iterations to produce dynamic solutions that will stand up under any conditions.

For example, in one fight against a small, agile infantry unit, OPFOR had to protect a cave complex containing a large store of munitions. BLUFOR's infantry chose the attack route least anticipated by OPFOR's commanders. Because scouts were slow to observe and communicate the change in BLUFOR's movements, OPFOR was unable to prevent an attack that broke through its defense perimeter. OPFOR was forced to hastily reposition its reserve and forward units. Much of its firepower didn't reach the crucial battle or arrived too late to affect the outcome.

OPFOR's unit leaders knew they could extract many different lessons from this situation. "To fight an agile infantry unit, we must locate and attack infantry before soldiers can leave their trucks" was the first and most basic. But they also knew that that insight was not enough to ensure future success. For example, scouts would have to figure out how to choose patrol routes and observation positions so as to quickly and accurately locate BLUFOR's infantry before it breached the defense. Then staffers would need to determine how to use informa-

tion from observation points to plan effective artillery missions—in the dark, against a moving target. The next challenge would be to test their assumptions to see first, if they could locate and target infantry sooner; and second, what difference that ability would make to them achieving their mission.

OPFOR's need to test theories is another reason the brigade conducts frequent brief AARs instead of one large wrap-up. The sooner a unit identifies targeting infantry as a skill it must develop, the more opportunities it has to try out different assumptions and strategies during a rotation and the less likely those lessons are to grow stale. So units design numerous small experiments—short cycles of "plan, prepare, execute, AAR"—within longer campaigns. That allows them to validate lessons for their own use and to ensure that the lessons they share with other teams are "complete"— meaning they can be applied in a variety of future situations. More important, soldiers see their performance improve as they apply those lessons, which sustains the learning culture.

Not all OPFOR experiments involve correcting what went wrong. Many involve seeing if what went right will continue to go right under different circumstances. So, for example, if OPFOR has validated the techniques it used to complete a mission, it might try the same mission at night or against an enemy armed with cutting-edge surveillance technology. A consulting-firm ad displays Tiger Woods squinting through the rain to complete a shot and the headline: "Conditions change. Results shouldn't." That could be OPFOR's motto.

In fact, rather than writing off extreme situations as onetime exceptions, OPFOR embraces them as learning opportunities. OPFOR's leaders relish facing an unusual enemy or situation because it allows them to build their repertoire. "It's a chance to measure just how good we are, as opposed to how good we think we are," explained one OPFOR commander. Such an attitude might seem antithetical to companies that can't imagine purposely handicapping themselves in any endeavor. But OPFOR knows that the more challenging the game, the stronger and more agile a competitor it will become.

More than a Postmortem
Corporate AARs are often convened around failed projects. The patient is pronounced

Five Ways to Put AARs to Work at Work

The U.S. Army's standing enemy brigade (referred to as OPFOR) applies the after-action review (AAR) process to everything it does, but that's not realistic for most companies. Business leaders must act selectively, with an eye toward resources and potential payoffs. Don't even think about creating an AAR regimen without determining who is likely to learn from it and how they will benefit. Build slowly, beginning with activities where the payoff is greatest and where leaders have committed to working through several AAR cycles. Focus on areas critical to a team's mission so members have good

reason to participate. And customize the process to fit each project and project phase. For example, during periods of intense activity, brief daily AAR meetings can help teams coordinate and improve the next day's activities. At other times, meetings might occur monthly or quarterly and be used to identify exceptions in volumes of operational data and to understand the causes. The level of activity should always match the potential value of lessons learned. On the next page are some ways you can use AARs, based on examples from companies that have used them effectively.

	The AAR in practice	**The payoff**
1 **Emergency response**	>> Survey past emergencies to identify types of events and learning challenges. >> Ask team members to take notes during the response process to facilitate the upcoming AAR. >> Conduct AARs during the response process (if possible) or immediately afterward to begin building procedures and long-term solutions. >> Periodically review past AARs to identify potential systems improvements.	>> Avoid similar emergencies in the future. >> Improve the speed and quality of your responses and damage control. >> Improve the long-term effectiveness of your solutions.
2 **Product development**	>> Start each phase of product development with a before-action review (BAR). >> Conduct AARs to identify insights to feed from one phase of product development into the next—and then into the next project. >> Periodically conduct AARs on the product-planning process to identify potential improvements.	>> Improve quality, reduce cost, and shorten time to market. >> Anticipate customers' changing expectations.
3 **Entering a new business or market**	>> Launch business planning with a BAR to reflect on past lessons. >> Conduct AARs throughout the launch process to test lessons and create innovative solutions. >> Conduct a wrap-up AAR to improve performance on the next venture.	>> Apply lessons from past successes and failures to improve results on new ventures.
4 **Sales**	>> Build AARs into the sales process, focusing as much on learning from wins as from losses. >> Conduct AARs on customer defections to competitors' products.	>> Improve the win/loss ratio. >> Refine the value proposition for a new product.
5 **Mergers and acquisitions**	>> Build AARs into strategy, negotiation, due diligence, and execution phases to continually reveal, test, and modify assumptions about the deal. >> Wrap up each M&A activity by comparing it with previous efforts to identify problems and good ideas.	>> Ensure that transactions deliver promised value to stakeholders.

dead, and everyone weighs in on the mistakes that contributed to his demise. The word "accountability" comes up a lot—generally it means "blame," which participants expend considerable energy trying to avoid. There is a sense of finality to these sessions. The team is putting a bad experience behind it.

"Accountability" comes up a lot during OPFOR's AARs as well, but in that context it is forward-looking rather than backward-looking. Units are accountable for learning their own lessons. And OPFOR's leaders are accountable for taking lessons from one situation and applying them to others—for forging explicit links between past experience and future performance.

At the end of an AAR meeting, the senior commander stands and offers his own assessment of the day's major lessons and how they relate to what was learned and validated during earlier actions. He also identifies the two or three lessons he expects will prove most relevant to the next battle or rotation. If the units focus on more than a few lessons at a time, they risk becoming overwhelmed. If they focus on lessons unlikely to be applied until far in the future, soldiers might forget.

At the meeting following the infantry battle described earlier, for example, the senior commander summed up this way: "To me, this set of battles was a good rehearsal for something

we'll see writ large in a few weeks. We really do need to take lessons from these fights, realizing that we'll have a far more mobile attack unit. Deception will be an issue. Multiple routes will be an issue. Our job is to figure out common targets. We need to rethink how to track movement. How many scouts do we need in close to the objective area to see soldiers? They will be extremely well-equipped. So one thing I'm challenging everyone to do is to be prepared to discard your norms next month. It's time to sit down and talk with your sergeants about how you fight a unit with a well-trained infantry."

Immediately after the AAR meeting breaks up, commanders gather their units to conduct their own AARs. Each group applies lessons from these AAR meetings to plan its future actions—for example, repositioning scouts to better track infantry movements in the next battle.

OPFOR also makes its lessons available to BLUFOR: The groups' commanders meet before rotations, and OPFOR's commander allows himself to be "captured" by BLUFOR at the conclusion of battles in order to attend its AARs. At those meetings, the OPFOR commander explains his brigade's planning assumptions and tactics and answers his opponents' questions.

Beyond those conferences with BLUFOR, formally spreading lessons to other units for later application—the chief focus of many corporate AARs—is not in OPFOR's job description. The U.S. Army uses formal knowledge systems to capture and disseminate important lessons to large, dispersed audiences, and the National Training Center contributes indirectly to those. (See the sidebar "Doctrine and Tactics.") Informal knowledge sharing among peers, however, is very common. OPFOR's leaders, for example, use e-mail and the Internet to stay in touch with leaders on combat duty. The OPFOR team shares freshly hatched insights and tactics with officers in Afghanistan and Iraq; those officers, in turn, describe new and unexpected situations cropping up in real battles. And, of course, OPFOR's leaders don't stay out in the Mojave Desert forever. Every year as part of the Army's regular rotation, one-third move to other units, which they seed with OPFOR-spawned thinking. Departing leaders leave behind "continuity folders" full of lessons and AAR notes for their successors.

In an environment where conditions change

Doctrine and Tactics

The lessons produced and validated by the U.S. Army's Opposing Force (OPFOR) and the units it trains at the National Training Center (NTC) in Fort Irwin, California, contribute to the Army's two classes of organizational knowledge. One class, known as Tactics, Techniques, and Procedures (TTP), focuses on how to perform specific tasks under specific conditions. It is the responsibility of each unit leader to build her own library of TTP by learning from other leaders as well as by capturing good ideas from her subordinates. Two unit leaders in the same brigade may need to employ different TTP to address different conditions.

Sufficiently weighty, widely applicable, and rigorously tested TTP may ultimately inform the Army's other class of organizational knowledge: doctrine. Doctrine—which rarely changes and is shared by the entire Army—establishes performance standards for the kinds of actions and conditions military units commonly face. For example, many of the steps in the doctrine for a brigade-level attack (such as planning for mobility, survivability, and air defense) began life as lessons from the NTC and other Army training centers.

The difference between doctrine and TTP is a useful one for businesses, some of which draw few distinctions among the types of knowledge employees generate and about how widely diverse lessons should be applied and disseminated.

Instead of producing static "knowledge assets" to file away in a management report or repository, OPFOR's AARs generate raw material that the brigade feeds back into the execution cycle.

constantly, knowledge is always a work in progress. So creating, collecting, and sharing knowledge are the responsibility of the people who can apply it. Knowledge is not a staff function.

The Corporate Version

It would be impractical for companies to adopt OPFOR's processes in their entirety. Still, many would benefit from making their own after-action reviews more like OPFOR's. The business landscape, after all, is competitive, protean, and often dangerous. An organization that doesn't merely extract lessons from experience but actually learns them can adapt more quickly and effectively than its rivals. And it is less likely to repeat the kinds of errors that gnaw away at stakeholder value.

Most of the practices we've described can be customized for corporate environments. Simpler forms of operational orders and brief backs, for example, can ensure that a project is seen the same way by everyone on the team and that each member understands his or her role in it. A corporate version, called a before-action review (BAR), requires teams to answer four questions before embarking on an important action: What are our intended results and measures? What challenges can we anticipate? What have we or others learned from similar situations? What will make us successful this time? The responses to those questions align the team's objectives and set the stage for an effective AAR meeting following the action. In addition, breaking projects into smaller chunks, bookended by short BAR and AAR meetings conducted in task-focused groups, establishes feedback loops that can help a project team maximize performance and develop a learning culture over time.

Every organization, every team, and every project will likely require different levels of preparation, execution, and review. However, we have distilled some best practices from the few companies we studied that use AARs well. For example, leaders should phase in an AAR regimen, beginning with the most important and complex work their business units perform. Teams should commit to holding short BAR and AAR meetings as they go, keeping things simple at first and developing the process slowly—adding rehearsals, knowledge-sharing activities and systems, richer metrics, and other features dictated by the particular practice.

While companies will differ on the specifics they adopt, four fundamentals of the OPFOR process are mandatory. Lessons must first and foremost benefit the team that extracts them. The AAR process must start at the beginning of the activity. Lessons must link explicitly to future actions. And leaders must hold everyone, especially themselves, accountable for learning.

By creating tight feedback cycles between thinking and action, AARs build an organization's ability to succeed in a variety of conditions. Former BLUFOR brigades that are now deploying to the Middle East take with them not just a set of lessons but also a refresher course on how to draw new lessons from situations for which they did not train—situations they may not even have imagined. In a fast-changing environment, the capacity to learn lessons is more valuable than any individual lesson learned. That capacity is what companies can gain by studying OPFOR.

Further Reading

This article is also available in an enhanced Harvard Business Review OnPoint edition, (Product no. 1525), which includes a summary of its key points and company examples to help you put the ideas to work. The OnPoint edition also includes the following suggestions for further reading:

Major Steckleson at the National Training Center (A)
Scott Snook, Jeremy Schneider, and Robert Kaderavek
Harvard Business School Case
January 5, 2004; revised August 26, 2004
Product no. 9-404-089

Learning in Action: A Guide to Putting the Learning Organization to Work
David A. Garvin
Harvard Business School Press
February 2003
Product no. 1903

Putting the Learning Organization to Work: Learning After Doing
David A. Garvin
Harvard Business School Publishing
May 20, 1996
Product no. 7099A

Harvard Business Review