

Deep Smarts

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When a person sizes up a complex situation and comes to a rapid decision that proves to be not just good but brilliant, you think, “That was smart.” After you’ve watched him do this a few times, you realize you’re in the presence of something special. It’s not raw brainpower, though that helps. It’s not emotional intelligence, either, though that, too, is often involved. It’s deep smarts, the stuff that produces that mysterious quality, good judgment. Those who have deep smarts can see the whole picture and yet zoom in on a specific problem others haven’t been able to diagnose. Almost intuitively, they can make the right decision, at the right level, with the right people. The manager who understands when and how to move into a new international market, the executive who knows just what kind of talk to give when her organization is in crisis, the technician who can track a product failure back to an interaction between independently produced elements—these are people whose knowledge would be hard to purchase on the open market. Their insight is based more on know-how than on facts; it comprises a system view as well as expertise in individual areas. Deep smarts are not philosophical—they’re not “wisdom” in that sense—but they’re as close to wisdom as business gets.

Throughout your organization, there are people with deep smarts. Their judgment and knowledge—both explicit and tacit—are stored in their heads and hands. Their knowledge is essential. The organization cannot progress without it. You will be a more effective

manager if you understand what deep smarts are, how they are cultivated, and how they can be transferred from one person to another.

Very few organizations manage this asset well, perhaps because it's difficult to pin down and measure. Such neglect is risky. Individuals develop practical, often organization-specific expertise over the course of many years but can walk out the door in only a minute, taking their smarts with them. As the baby-boom-retirement tsunami approaches, lots of valuable employees and leaders will do precisely that. By 2006, for example, half of NASA's workforce will be eligible for retirement. It's not easy to harvest future retirees' knowledge, since much of it depends on context. Those with deep smarts know your business, your customers, and your product lines, both overall and in depth. And much of their insight is neither documented nor even articulated. You may not know you have lost it until you feel the cold breezes of ignorance blowing through the cracks in your product or service architecture.

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Smaller-scale losses occur when employees with deep smarts are transferred to new locations, functions, or roles. A marketing director we know was promoted to a general management position, which encompassed new functions and required new skills. Her predecessor was scheduled to be on a plane to take a new position in Thailand within two days of the promotion, so she needed to learn about engineering, manufacturing, finance, and sales—fast. She couldn't possibly pick up the necessary skills in such a short time, but her superiors didn't even consider the costs of forcing her to muddle through on her own. Much of her predecessor's knowledge was lost.

When veterans leave, it is painful to lose strategic capabilities partly because growing them in the first place is extraordinarily challenging. Deep smarts are experience based. They can't be produced overnight or imported readily, as many companies pursuing a

new strategy have discovered to their dismay. But with the right techniques, this sort of knowledge can be taught—if a company is willing to invest. Brad Anderson, the CEO of Best Buy, recently decided that the future success of his company depended on building an internal capability to innovate continuously. His employees were bright, hardworking, and terrific at delivering on set goals, but innovation had never been part of their job. Exhortation alone would not change the DNA of the organization. Anderson needed to have some deep smarts about the innovation process transferred into the company. He hired the consulting firm Strategos to coach a cohort of employees through a six-month innovation journey. He hoped participants would gain enough experience to start embedding innovative practices throughout the organization.

Best Buy's deliberate decision to build companywide expertise is unusual. In most organizations, deep smarts develop more by chance than by intent—and often in spite of management practices rather than because of them. Leaders toss people willy-nilly into new situations, incurring the costs of trial-and-error learning instead of those associated with more carefully planned transitions. But it is neither effective nor efficient to cultivate experience-based know-how in such an ad hoc fashion or to rely on a company's existing processes for transferring knowledge. Most organizational practices are not grounded in a fundamental understanding of how people learn. Furthermore, most companies' training and development programs are designed to transfer explicit technical or managerial knowledge—but not deep smarts.

We learned to appreciate the importance of deep smarts when we studied how novices acquire complex managerial skills. Over two years, we conducted research at 35 start-up companies in the United States and Asia, looking most closely at how experienced coaches helped novice entrepreneurs. We also examined a number of mature organizations, including Jet Propulsion Laboratory in Pasadena, California, and Best Buy, in which managers were struggling with how to cultivate business wisdom. We interviewed more than 200 people (including each of the novice entrepreneurs and their coaches) twice, a year apart; sat in on dozens of meetings; shadowed one experienced leader as he made rounds to various protégés in India; and reviewed scores of videotapes

made by people undergoing the intensive knowledge transfer effort at Best Buy. In the following pages, we draw on this field research to illustrate how organizations can develop and sustain profound institutional knowledge among their employees.

How Did He Do That?

Let's look in particular at two examples of deep smarts—one technical and the other managerial.

In the 1980s, two companies were competing for a multibillion-dollar, decades-long government contract for tactical missiles. Neither had a performance advantage. The stalemate was broken by a scientist in one of the companies who was not a member of the project team. His reputation as a technical wizard (based on more than 20 years of experience developing missiles) was such that when he called a meeting of the primary project participants, they all came. For several hours, he enthralled them with a detailed proposal for design changes that he had worked out over a single week of dedicated effort. Without notes, he walked them through the redesign of an entire weapon. To put the extensive software, wiring, and hardware changes he suggested into production, as many as 400 people would have to work full-time for up to a year and a half—but the expert's audience saw immediately that the modifications would create tremendous competitive advantage. His proposal precipitated a frenzy of activity, and his company won the contract. More than 20 years later, it is still reaping the harvest sown by this man with deep smarts.

Deep smarts are most easily recognized when, as in the previous example, they are based on technical knowledge. Managerial deep smarts are harder to identify, but we know that people who have them are compelling leaders. Take the case of a CEO who, in an unusual reversal of roles, had to talk his board of directors out of allowing the company to miss its earnings commitment. In early 1997, Intuit had just sold off its bill-paying operations. The board met to consider a new strategic direction. Because revenues were down, the sentiment around the boardroom table was that the company would have to miss its earnings commitments not only for that quarter but for the foreseeable future. Board members were further resigned to a drop in stock price when the earnings were announced.

CEO Bill Campbell argued passionately against this fatalistic viewpoint. Wall Street analysts, he said, had already discounted the slower growth and the resulting decline in the top line. Lower revenues would not hurt the stock price. But deliberately deciding midway through the quarter to miss earnings was contrary to good management practices. Perhaps even more important, Campbell pointed out, if the stock dropped, employee options would be worthless—and some critical individuals might well leave the company. Such defections could hurt Intuit even more than the financial blow *per se*. It was pure baloney that they could not make the bottom line! He knew how to cut costs—and where to start.

The board members were persuaded by Campbell, and the next few months proved him right. Managers cut expenses and hit their quarterly financial targets, and the stock stayed steady. The course set out in the board meeting was successful for Intuit, and Campbell's promise to employees that the stock would double within a year was fulfilled. What smarts did Campbell have that allowed him to make the right decision—and to sway his board? He knew, of course, the details of his company's operations well enough to pinpoint areas for potential cost cutting. But he also understood the big picture, the financial environment within which he operated; he knew how resilient Intuit could be and how to release the company's untapped energies. He could foresee both Wall Street's reactions and those of his employees. And finally, he understood group dynamics and the personalities of his board members well enough to offer persuasive arguments.

Both the missile expert and Bill Campbell demonstrated an ability to do systems thinking *and* to dive into the details. The former, who redesigned a whole weapon by himself, knew a lot about each piece of software and hardware—but also about how they had to interact and which parts might need to be suboptimized in order to make the whole system perform better. Campbell could pull operational details about his company out of his head, but he also was emotionally intelligent about his organization as a collection of people and understood the larger financial milieu in which Intuit functioned.

The Science Behind Deep Smarts

Experience is the obvious reason that such deeply knowledgeable individuals make swift, smart decisions. We would all rather fly with a pilot who has taken off, flown, and (especially) landed in all kinds of extreme weather than with one who has always enjoyed smooth conditions. Similarly, if we're about to go under anesthesia, we don't want to hear the surgeon exclaim, "Wow—never seen one of *these* before!" And when launching a new product, we would prefer a boss who understands design, marketing, and manufacturing over one who sees the world through only one lens. But what is it about experience that separates novices from experts?

Think about something you are really, really good at—chess or cooking or interviewing job candidates. Chances are, if you are not just competent, but truly expert, it took ten years or more to develop that expertise—in which time you've come across countless different situations. With so many of them under your belt, you have likely found some common ground and discovered a few rules of thumb that usually work: "Control the center of the board" in chess, for instance, or "Err on the side of letting people go early rather than late" in management. However, as an expert, you have the perspective to go beyond generalizations and respond to unusual situations. You know when facile rules don't apply, because you've seen so many exceptions. When confronted with a setback or a surprise, you can modify your course of action by combining elements from your menu of familiar options. In short, you can exploit an extensive *experience repertoire*.

Experts who encounter a wide variety of situations over many years accumulate a storehouse of knowledge and, with it, the ability to reason swiftly and without a lot of conscious effort. Those with keen managerial or technical intuition can rapidly determine whether current cases fit any patterns that have emerged in the past; they're also adept at coherently (though not always consciously) assembling disparate elements into a whole that makes sense. They can identify both trends and anomalies that would escape the notice of less-experienced individuals. When you ask your financial wizard how she decided so quickly that there was something wrong with the numbers on a page, she may not be able to tell you exactly how she homed in on the odd figure. In fact, when asked to explain a decision, experts often cannot re-create all the pathways their brains checked out and so cannot give a carefully reasoned answer. They chalk up to gut *feel* what is really a form of gut *knowledge*.

Of course, the experts aren't always right. Their confidence can lead to myopia or arrogance, blinding them to truly novel solutions or causing them to reject contributions from others. They can underestimate the extent to which knowledge is actually a set of beliefs and assumptions. When a physician confidently prescribes an acid suppressant for a woman who is in fact having a heart attack, not indigestion, he may be fitting her symptoms into a schema built on research about men. No chest pains—ergo, no heart attack. Only as research reveals that women's heart attack symptoms differ from men's, and as medicine builds enough knowledge to characterize these differences, will the physician be prepared to recognize the danger of his snap judgment.

Characteristics and Limitations of Deep Smarts

Sometimes an expert is the key actor in a managerial setting. Sometimes a novice is. Give them both a managerial task, and they'll approach it in characteristically different ways. And the experts aren't always right—they run risks, too.

Tasks	Novice	Expert	Expert's Limitations
Making decisions	Needs to review all facts and choose deliberately among alternatives	Makes decisions swiftly, efficiently, without reviewing basic facts	Overconfidence; expert may ignore relevant data
Considering context	Relies on rules of thumb that minimize context	Takes context into account when solving problems	Difficulty transferring expert knowledge, because it is highly contextualized
Extrapolating information	Lacks receptors and thus has limited basis for extrapolation	Can extrapolate from a novel situation to find a solution	May base solution on inappropriate pattern
Exercising discrimination	Uses rules of thumb to obscure fine distinctions	Can make fine distinctions	May not communicate well to a novice who lacks receptors to understand distinctions
Being aware of knowledge gaps	Doesn't know what he doesn't know	Knows when rules don't apply	May assume expertise where none exists
Recognizing patterns	Has limited experience from which to draw patterns	Has large inventory of patterns drawn from experience	May be no better than novice when no patterns exist
Using tacit knowledge	Relies largely on explicit knowledge	Uses extensive tacit knowledge to drive decision making	May have a hard time articulating and thus transferring tacit knowledge

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Making Sure the Catcher Is Ready Before You Pitch

Many times in our lives, we need either to transfer our knowledge to someone else (a child, a junior colleague, a peer) or to access bits of wisdom accumulated in someone else's cranium. But before we can even begin to plan such a transfer, we must understand how our brains process incoming information.

What we already have in our heads determines how we assimilate new experiences. Without receptors—hooks on which to hang new information—we may not even perceive and process the information. It's like being sent boxes of documents but having no idea how they could or should be organized. Scientists who study specialized functions of the brain note that specific areas link our perceptions to long-term memory. For someone to capture complex, experience-based knowledge, his brain has to contain some frameworks, domain knowledge, or prior experiences to which current inputs can connect. Otherwise, the messages and information sent remain relatively meaningless suggestions. To a person who is unfamiliar with finance, the following advice is merely a string of words: "If you borrow money to buy back a lot of stock, you increase return on equity, but not in a way that those hawks at Moody's would approve of." Take a nonbusiness example: "What three-dimensional avatar would you like to be in the next MUD you enter?" To many people, that question is almost unintelligible—but not to an online gamer who has represented herself in cyberspace as a three-dimensional object (an avatar) while playing in a multiuser domain (MUD). Even when the terms are explained, however, a nongamer will not know what criteria to use in selecting an avatar. Someone who has not played such games lacks the receptors to process the query intelligently.

This cognitive limitation exists at an organizational level as well. When GE Healthcare sets up or transfers operations from one location to another, for instance, it appoints an experienced manager and team to be the "pitcher" and a team in the receiving plant to be the "catcher." These two teams work together, often over a period of years, first at the pitcher's location and then at the catcher's. To ensure a smooth transition, the pitcher team needs to be sensitive to the catcher team's level of experience and familiarity with GE Healthcare procedures. When a veteran operations manager arrived at a growing GE Healthcare plant in China, the local team was getting ready to move raw materials from the manufacturing facility into a warehouse. The operations manager could see numerous potential problems with the chosen site, but he knew that simply vetoing it would have transferred little knowledge. So he helped the team develop a list of critical-to-quality (CTQ) factors against which to evaluate potential sites. (Although this analytic process is standard operating procedure at GE, the Chinese plant hadn't adopted it yet.) The list included such factors as proximity to the manufacturing plant, easy access for large trucks, road conditions between facilities, and basic amenities for employees. List in

hand, the catchers visited the selected site and could see that it met few of their criteria. They then understood the reasons for using the CTQ model for even apparently simple choices; they had a framework and some basic experience on which to build future decisions.

In many situations requiring the transfer of deep smarts, new people are thrown in to sink or swim. Sometimes they make it. They're often quick studies and have other adaptive skills. If they come into the job with few preconceptions about what does and doesn't work, they may suggest smart changes. So a deliberate decision *not* to transfer knowledge to the newcomer can have advantages. But usually, the sink-or-swim strategy is inefficient and—more important—ineffective. It is far better to deliberately create receptors by providing frameworks and tools or other types of mental structures to which experience can be tied.

Guided Experience Versus Other Types of Learning

Guided experience—learning by doing, with feedback from a knowledge coach—creates deep understanding. It is especially valuable when:

Situations	Examples
The skills to be learned involve interpersonal relations, so there is no set of absolute steps but rather an array of possible responses to the actions and emotions of others.	> working with a board of directors > negotiating a merger or acquisition > handling a talented prima donna
There are many tacit dimensions to the skills, so even an expert may not be able to make them all explicit.	> closing a sale > dissipating tension in a meeting > creating a new perfume or best-selling wine
The knowledge is context specific, so it's appropriate to be adaptive rather than apply formulas.	> managing in a foreign culture > manufacturing with proprietary, plant-specific equipment > handling sexual harassment cases
The situation is new, so there is great uncertainty.	> launching a new service product in a new market > using a new mode of manufacturing

Rules create a mental scaffold on which to hang experience. They help people make sense of their experience but do not serve as a substitute

for it. People with deep smarts will know exceptions to the rules in their domain and will feel comfortable augmenting them. But guidelines can be appropriate and helpful as a starting point, especially when:

Situations	Examples
The skills to be learned are largely cognitive, generate little emotion, and are relatively independent of individual differences.	> accounting practices > statistical analysis of market segments
There are explicit, communicable ideas and models.	> strategic analysis using Michael Porter's "five forces" model > financial analysis of a business plan
The processes are unvarying and relatively independent of context.	> Six Sigma applications > the running of democratic meetings
The domain is well understood and explored, and there is little uncertainty about what works.	> high-volume assembly line manufacturing > product positioning on shelves

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Transfer Techniques

Receptors, of course, are not enough. The most valuable part of deep smarts is the tacit know-how (and often, know-who) that a person has built up over years of experience. This knowledge cannot be easily documented and handed over in a filing cabinet or on a CD. Managers are sophisticated; they recognize that documentation and software are inadequate to capture deep knowledge. Why, then, do they persist in relying on a thick deck of PowerPoint slides, a Web site of best practices, a repository of project reports, online training, or even in-person lectures for the transfer? Even the smartest people have difficulty gaining insight from such materials, because so much of the knowledge they need is tied to specific contexts and has tacit dimensions.

The central paradox in transferring deep smarts is that constantly reinventing the wheel is inefficient, but people learn only by doing. So what's the best way to get them up to speed? In our research, we identified a number of techniques used by what we call knowledge coaches—experts who were motivated to share some of their deep smarts with

protégés. While some played the traditional mentor role of helping their protégés navigate organizations or providing personal advice, the coaches primarily served as teachers transmitting experience-based expertise.

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As the exhibit “Moving Toward Deep Smarts” suggests, approaches vary considerably—and predictably—in how effectively they address the deep-smarts paradox. Most of these modes are well understood. A number of books have been written about storytelling, for example, as a potent way to convey nuanced information. And Socratic questioning is pretty common. Queries such as “How do you know?” and “What would happen if...?” stimulate reflection and active learning. However, the learning-by-doing methods are not as familiar to many readers. They require active engagement from both the teacher and the student, they take time, and they usually happen one-on-one.

Moving Toward Deep Smarts



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Recall that deep smarts are based on an extensive experience repertoire. While it’s true that merely describing experiences to people (or telling them what to do or giving them rules) may create some mental receptors upon which to hang experience, the tacit dimensions of an expert’s deep smarts have to be *re-created* to take hold. That is, the novice needs to discover the expert’s know-how through practice, observation, problem solving, and experimentation—all under the direction of a knowledge coach. In the process, the smarts of both the expert and the novice are deepened.

Guided Practice.

The old adage is right: Practice *does* make perfect—or at least better. But mindless repetition can hone the wrong skills. Better is mindful, reflective practice, in which outcomes are assessed and the method adjusted appropriately. But best of all is practice under the tutelage of someone who can guide the reflection and provide performance feedback. This is where an experienced coach comes in.

At SAIC, a consulting firm in San Diego that works primarily with the U.S. government, consultants learn their trade from a seasoned pro first by watching the expert help a client pick up a particular knowledge management process, next by leading a client session and receiving feedback from the coach, and then by teaching another consultant how to work with a client. This “see one, lead one, teach one” approach is one of SAIC’s most useful knowledge transfer tools.

Guided Observation.

Another powerful technique, guided observation, can be used for two very different purposes: to re-create deep smarts and to challenge ossified assumptions that may be based on outdated experience.

If your goal is to re-create deep smarts, you can have a “catcher” shadow an experienced, skilled colleague and arrange for the two to meet afterward to discuss what the catcher observed. A top consultant was once asked where and how he learned his skills in closing deals with clients. He explained that when he joined the company, an elder statesman in the firm asked him to sit in on client meetings. “You don’t have to say a word,” the older consultant told him. “Just listen and learn.” The junior consultant rightly took that invitation as more than a suggestion and sat at the back of the room. After the meetings, he and the older consultant discussed what had occurred. “I learned more from those debriefs,” he said, “than in four years at my prior company and two years of business school.”

The combination of shadowing and feedback sessions works because, as we have said, deep smarts are based largely on pattern recognition and are highly contextual. Because there are so many tacit dimensions to this sort of insight, the individual possessing it will not always realize what she knows until a particular challenge calls her knowledge forth.

This makes it difficult for her to give her protégé absolute, detailed directives to follow in general. She might not be able to tell a novice what the response should be to a particular situation, but she can show him.

What if the issue is not so much teaching new skills but convincing individuals to unlearn what they take for granted? We can't deepen our smarts without challenging our beliefs about our clients, our organizations, our services. Field trips—playing anthropologist for a few days to observe behaviors at other sites or companies—can help. Exposed to foreign ways of thinking and behaving, people not only extend their experience repertoire but are often shocked into questioning their own complacent understanding of the world.

When consultants from Strategos guided teams from Best Buy through the intricate steps of identifying, exploring, and prototyping new business opportunities, they first challenged the team members' assumptions about the company's uses of technology to attract typical Best Buy customers—young males who purchase powerful, feature-rich electronics. The consultants then sent team members on the road. Best Buy's Toby Nord took a trip with some colleagues to American Girl Place in Chicago that proved invaluable, though initially unsettling. American Girl specializes in a line of dolls representing historical eras. More of a destination than a retail outlet, the store features doll-centric activities: You can get a new hairdo for your doll, for example, or have tea and scones at the American Girl Cafe, where dolls sit at the table. Nord and his male colleagues were pushed out of their comfort zone. But Nord realized that the dolls at American Girl Place were a kind of platform for intergenerational socializing among grandmothers, mothers, and daughters. The store was entertaining, and its business focused tightly on a community built for a given demographic: women and girls.

The Best Buy team combined observations from this trip to Chicago and others to Mexico City, the Amish countryside in Indiana, and Seoul, South Korea, and began to see behavior patterns. All these visits stimulated thinking about social, communal behavior focused on a platform, product, or technology. The team began to generate ideas for products and services that would offer an experience or a social happening. Inspired by the groups of teens they saw in Seoul gathering to play video games, the Best Buy folks

came up with a youth-centered entertainment concept: a “PCBang,” where teenagers and people in their early twenties (a demographic group younger than Best Buy’s typical consumers) will be able to play computer games together and socialize.

Guided Problem Solving.

Guided problem solving serves different purposes and requires more active engagement from the protégé than does guided observation. A knowledge coach may or may not already know the answer to a problem. But either way, if he works on it with his protégé, the novice can learn how to approach the problem. That is, the knowledge coach transfers know-how more than know-what. During their residencies, newly minted physicians convert their book smarts into deeper, experience-based smarts as they work beside veteran doctors over a period of years.

Apprenticeships in business are less formalized—but they do occur in companies where managers are alert to the need for re-creating tacit knowledge. In an engineering company, a highly experienced design engineer was asked to train a younger colleague in the kind of systems thinking for which the older man was renowned. One of the senior engineer’s most valued skills was the ability to bring multiple perspectives to any design—not just engineering knowledge about every component (software and hardware) in the complex systems the company manufactured, but also an understanding of how the systems were to be produced. He was famous for detecting and avoiding potential assembly problems and performance shortfalls. To transfer his understanding of the overall product architecture and his respect for manufacturing constraints, he had his protégé go down to the assembly line and work on problems with a test engineer for several months. The senior engineer joined many of these problem-solving sessions, adding information that the test technician lacked, such as historic customer biases and preferences. While the protégé gained specific knowledge about component parts, the more important know-how transferred was the ability to look at the whole system, see how the interfaces worked, and understand how different functional priorities led to specific design flaws. The protégé also got to know and respect the knowledge of people working on the assembly line. This experience enhanced his organizational know-who, altered his belief systems, and contributed to his technical expertise.

Guided problem solving combines many of the best features of the transfer techniques mentioned previously: focusing attention, sharpening process skills, giving feedback, providing an opportunity to mimic an expert, engaging the learner actively in developing her own deep smarts, and building an experience repertoire.

Guided Experimentation.

In the first few years of their lives, children learn at a fantastic rate, partly because they are constantly experimenting. (Of course, that's what makes parents of toddlers so nervous.) Too often in organizations, we assume that experimentation is both a risky and an expensive way of learning. It doesn't have to be. The best entrepreneurial coaches in our study of 35 start-ups encouraged their charges to set up deliberate but modest experiments. This was the case with ActivePhoto, a company based on a software system that instantly downloads and catalogs digital photographs for use in a business process. In search of its best market, ActivePhoto initially considered three promising customer bases: public emergency services, insurance claims processing, and online auctioning. The tiny seven-person firm would ultimately have to choose one or two markets, but in its first few months of life it experimented with all three. Pilot studies, along with discussions with knowledge coaches, allowed the ActivePhoto people to evaluate the results of each experiment and quickly eliminate the first market.

Most retail companies use pilot markets to test new products—rolling them out in one area of the country before going national. When Whirlpool was considering custom-built appliances, the company was advised to find out whether customers were interested and whether customization would generate more market share or more profit. In a fairly simple and inexpensive experiment, Whirlpool selected two retail outlets in each of two cities (Dallas and Philadelphia) in which to set up tests for custom appliances. To draw crowds, the stores funded local advertising campaigns (“Come build your own Whirlpool refrigerator down at XYZ Appliances”). Computer kiosks in the stores allowed customers to choose from a variety of appliance features, and workers in the back busily assembled what people ordered. What did Whirlpool learn? As expected, customizing helped in the share game, at least for these four outlets. But the experiment also produced an unanticipated outcome: Customers ordered more features—approximately \$70 more per refrigerator.

Coaches can offer good advice about where and how much to experiment—and more important, they can improve a team’s attitude toward adding to deep smarts through experimentation. The Toyota Production System is admired for its efficient manufacturing and has attracted imitators worldwide. But researchers who have investigated the deep smarts underlying TPS have discovered that the explicit techniques so widely copied (kanban cards, andon cords, just-in-time inventory delivery) do not account for the true advantage that Toyota has. The real secret to Toyota’s success is the mind-set of its employees: to constantly hypothesize about possible improvements and test those hypotheses in experiments. (See “Decoding the DNA of the Toyota Production System,” by Steven Spear and H. Kent Bowen, in the September–October 1999 issue of HBR.) This sort of mind-set is possible in any industry, including service. At any given time, Bank of America’s innovation and development teams are conducting more than two dozen experiments in operating branches, such as “virtual tellers,” video monitors displaying financial and investment news, computer stations where customers can upload images of their canceled checks, and kiosks staffed by associates ready to open accounts or process loan applications.

But Does It Cost Too Much?

In our world of fast brain food, one might think that guided experience is passé at best—or at least too costly. We have heard an executive from a well-run *Fortune* 100 company say, “The days of apprenticeship are over. We don’t have enough people to mentor newcomers.” Many who share this view will nonetheless willingly spend millions of dollars and years of effort on data repositories and formal training. We certainly do not wish to suggest that all such investments are wasteful. But we’re convinced that guided experience is the only way to cultivate deep smarts—and that managers need to be realistic about how much tacit, context-specific knowledge can be created or transferred through other means.

Fortunately, guided experience can deliver two benefits simultaneously and thus is not as costly as it might seem: first, a lasting asset in the form of transferred know-how, and second, delivery of a new business process, product idea, or capability. The learning happens on the job, so the business situations are real and relevant to today’s problems. SAIC’s training of U.S. Army personnel in the “peer assist” technique, for example, not

only transfers process knowledge but does so in the context of a real problem—how to improve the performance of contract officers. Similarly, Strategos consultants were not only training Whirlpool and Best Buy employees to develop innovation processes; they were also showing these clients how to identify new business opportunities.

Guided experience increases value exponentially—it promotes dual-purpose learning and builds on all that we know about how people accumulate and retain knowledge. How can companies afford *not* to invest in it?

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