Leverage Success:

Profit from Mistakes

How to build organizations that capture, share, use, and improve valuable experience.

J. Ford Brett

Frontline Group

May 2001

Frontline Group

www.frontline-group.com

built2learn@frontline-group.com

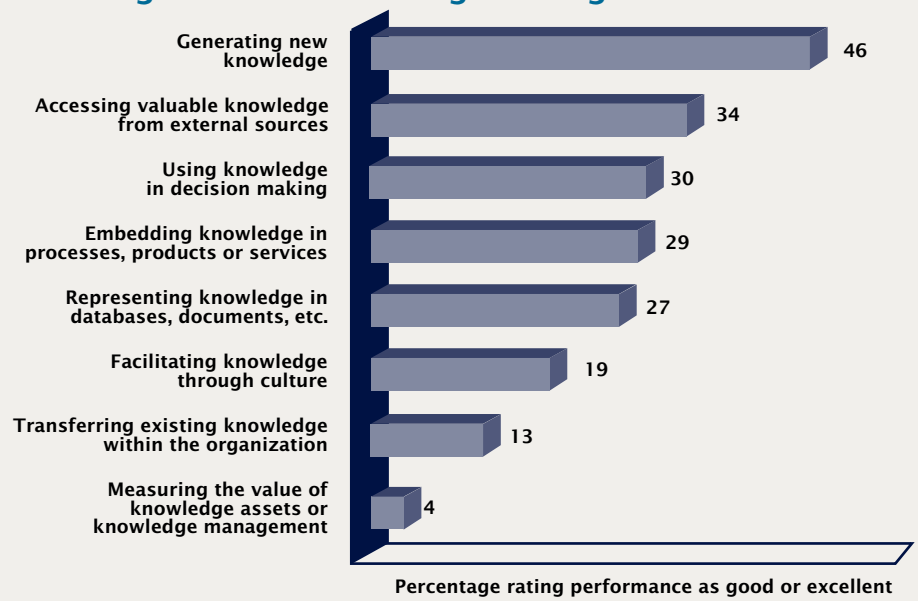
What Is Knowledge Management? Who Cares?

Only one in 25 companies measure the value of their knowledge assets.

Go to the Web and search for "knowledge management." Use one search engine, www.google.com, and you'll find about 2,510,000 matches. That's 20,000 matches more than the 2,490,000 found when searching for "New York City" at the time this paper was written. At just a few of those Web sites, you could easily find more than two dozen different definitions for knowledge management. Clearly, people are talking about the subject, but they don't agree on what it is.

A certain degree of confusion around a new business concept is understandable. Surprisingly, though, few organizations even know whether all the activity around knowledge management adds measurable value. A study by Rudy Ruggles of 431 companies (see Figure 1) showed that while almost half rated their ability to "generate new knowledge" as either good or excellent, only 13 percent rated "transferring of existing knowledge within the organization" as being good or excellent and a mere 4 percent—only one in 25—rated "measuring the value of knowledge assets or knowledge management" as good or excellent.

Figure 1: Self-Assessment of How Well Organizations Are Doing in Their Knowledge Management Activities



Source: Ruggles, Rudy. "The State of the Notion: Knowledge Management in Practice," *California Management Review*, v40, p80.

Knowledge management does have promise. Although few people agree on exactly what knowledge management is, its purpose should be clear: to improve an organization's performance. Having an organization's best experience captured, shared, and used by those who need it intuitively has benefits. Clearly, if everyone in an organization could function at the level of its best performers, the economic return would be immense.

Imagine everyone in an organization always knowing exactly the right thing to do. That organization would reliably capture, share, use, and improve its best experience to leverage successes and eliminate repeated mistakes. There would be no "I thought that was their job," "I could have told you that would have happened," "I wish John were still here; he could do a good job," or "How was I supposed to know?" In such

an organization, mistakes might even become a positive thing. New mistakes, if they happened once, wouldn't be something to fear; rather, they would be proof that the organization was on the edge, exploring new opportunities and learning from the experience.

Knowledge management's purpose: to improve an organizations's performance.

The purpose of this paper is not to create yet another definition or theoretical discussion of knowledge management. Instead, it is to provide a practical approach for organizations to:

1. Value their knowledge management efforts (the very thing only 4 percent of organizations surveyed think they do well).

2. Transfer knowledge within the organization (which only 13 percent of organizations think they do well).

This paper addresses these two pivotal knowledge management issues in four sections:

- Section 1 describes how to value investments in knowledge management by building a business case.
- Section 2 illustrates how to inventory and classify valuable knowledge.
- Section 3 explains how to manage and renew a group's knowledge base.
- Section 4 presents a practical approach for making knowledge management and renewal a reality.

Each of the four sections has a corresponding appendix. These appendixes do not contain nice-to-know details but rather important considerations for the design and implementation of a successful knowledge management approach. Anyone serious about starting a knowledge management effort should read the appendixes.

Valuing Investments in Knowledge Management

If knowledge management is to be more than another workplace fad, it needs to prove economic return. The Ruggles study showed that too many knowledge management efforts lack a clear understanding of how to add value and, therefore, bring little certainty of return. Unfortunately for non-accountants, proving economic return means understanding cash flow.

It's simple but worth reiterating that economic value is created when there is a positive net present value (NPV) of an investment's cash-flow stream. Keeping track of net cash flow vs. time is the only way to know the ultimate value of an investment. A positive NPV means the investment is a winner. The only way to know whether a potential investment is likely to be a winner is to reliably predict the investment's NPV. Managers of all sorts make all kinds of investments by predicting, with some level of certainty, how cash will flow over time. Investments in new factories, grocery stores, new product launches, cell phone towers, novel drugs, sports teams, and oil wells—investments in any real business enterprise—are normally subject to this kind of scrutiny.

Investments in knowledge management should be subjected to a similar type of analysis, or they cannot really be considered management decisions. Without scrutiny, such

activities are better classified as knowledge administration or maybe even knowledge art. Unless knowledge management efforts are specifically designed to add value to the organization, they will succeed only through luck.

Building a Knowledge Management Business Case

If you can estimate how knowledge affects cash flow, you can value knowledge management.

Appendix A outlines a practical approach to building a knowledge management business case. Briefly, the approach calls for four basic steps:

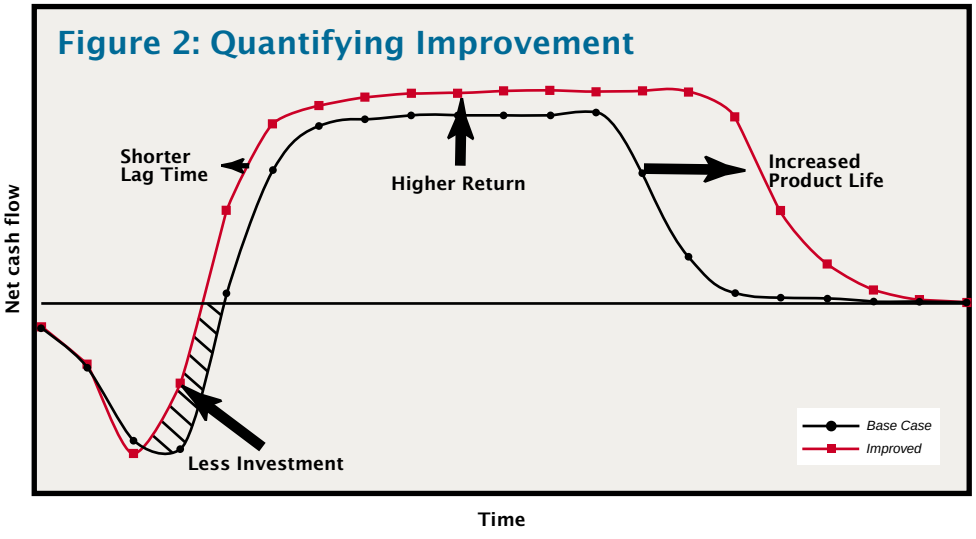
1. Inventory your core value-producing activities. Identify the core processes or activities that add the bulk of the value to your organization. Use the 80-20 rule; key in on what the organization does best.

2. Quantify business-as-usual cash-flow profiles. Clearly understand the full cycle economics of your core value-producing activities. Build a typical (high-medium-low) cash-flow profile from start to end of each activity.

3. Quantify how knowledge management will add value. Based on experience or reasoned estimates, quantify how better use of know-how would likely reduce the investment, shorten cycle time, produce higher return, or increase the productive life of the core value-producing activities. Answer the following question: "If everyone knew the right thing to do at every instant, what would our performance likely be?"

4. Calculate the NPV of incremental cash flows. With an understanding of current economics and reasoned estimates of how knowledge might improve the value of core value-producing processes, it's possible to create estimates for a range of NPVs for better use of knowledge.

Although these steps are likely tedious, they are not intellectually difficult. Figure 2 demonstrates the idea (see Appendix A for more details). Following the four steps is practical, and they will help you value knowledge management activities. More important, the four steps will focus your efforts on those activities that truly add value.



A simple-to-use tool based on this approach can help you quantify the value of knowledge management. The tool, called the Knowledge Value Calculator, is available at

www.built2learn.com. You can use the tool to put a value on knowledge management and review example situations, including a management change effort, a software development process, and an oil field development. The examples show that returns on knowledge management investments can easily be 300 percent to 500 percent.

Most of an Organization's Assets Are Intellectual Capital

Management literature increasingly recognizes that a company's assets as they appear on balance sheets do not represent the majority of its actual assets. The intangible assets, which normally go unmeasured and unmanaged, far outweigh the tangible assets. One concept called "intellectual capital" attempts to quantify the value of knowledge assets by calculating the difference between the organization's market value and the replacement value of its hard assets. This idea has flaws (e.g., How do you

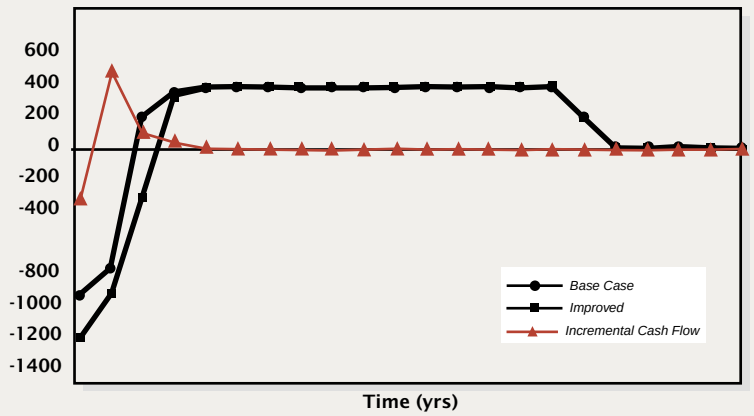
A Real Example: Large-Scale Franchise Expansion

Consider one real-life case. An organization was trying to quickly locate, acquire, permit, zone, design, construct, and commission about 1,500 franchise sites throughout the United States in three years. The organization faced with this task had managed only 40 sites per year for the previous three years. Increasing to 500 sites per year was a challenge the organization was having difficulty meeting. There were cost overruns, quality problems, and schedule delays—all caused by preventable problems.

Figure 3 shows how improved knowledge management resulted in huge returns for the entire effort through relatively small improvements in performance. These projects typically cost $2 million each. By creating a method to share best practices online throughout approximately 40 teams, the company was able to reduce its investment by 10 percent (saving $200,000) and its time lag by 20 percent (reducing cycle time per project from 12 to nine months). Every team member was able to learn the latest best practices for locating, acquiring, zoning, permitting, designing, constructing, and commissioning each site. With no improvements in return or useful life, this increased the NPV of each site by $173,000 (57 percent). More important, the $50,000 average cost per site for development and implementation of the effort meant that the return on the investment in this knowledge management effort was more than 300 percent.

Figure 3: Full-Cycle Value of Cycle Time and Performance Improvement

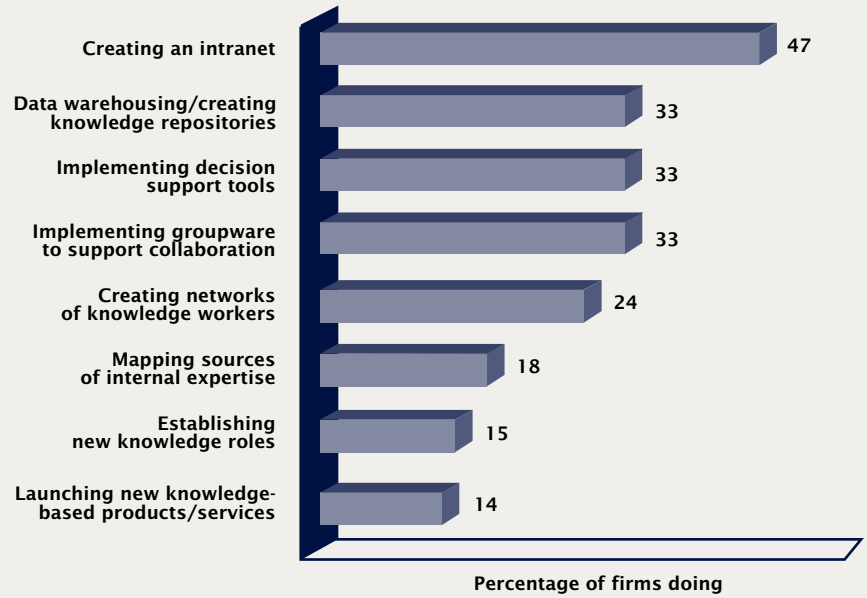
	Base	Improved
Development Costs		
Total Project Dev. Costs, Total Investment	$2,000	$1,800
Time @ Peak Devel. Exp. (yrs.)	1.0	0.8
Revenue		
Max. Net Revenue (1/yr)	$ 375	$ 375
First Production (yrs.)	1.0	0.8
Useful Life	14.0	14.0
Economics		
Discount Rate	13%	
NPV	225	403
Discounted ROI (NPV/PVCost)	14%	26%
% Improvement - CYCLE TIME		20%
% Improvement - CAPITAL COST		10%
% Improvement - OPERATING REVENUE		0%
Improvement Effort Investment		$ 50.0
Improvement Effort Incremental NPV		$173.0
Improvement Effort DROI		346%



measure replacement value? What is the real market value of the organization?), but it points out that for almost every organization with any kind of a future, most of the value (commonly 80 percent) is resident in something other than hard assets: its intellectual capital.

Tacit or explicit, individual or group, static or dynamic—confuse these types of knowledge and you can't manage them.

Figure 4: Types of Knowledge Management Projects in Process



This recognition has led to the growing focus, interest, and use of knowledge management tools and techniques in major companies worldwide. Figure 4 shows some of the efforts that companies reported in Ruggles' study. A lot of organizations are trying a lot of things.

Despite the growing interest and focus, few of these knowledge-management-oriented projects can be described and presented as successful best-practices candidates because only one in 25 companies in the Ruggles study properly valued the knowledge management effort. Reliable application of the approach outlined here and detailed in Appendix A would raise that ratio. More important, it would focus knowledge management efforts on things that would really add value.

How to Manage and Renew a Knowledge Base

The previous section explained how to find the highest value activities and how managing knowledge better might increase their value. But knowing which knowledge is valuable isn't the same as being able to manage it. To manage knowledge profitably, you need to know what kind of knowledge you're dealing with and then use the right management approach for that type of knowledge. Different types of knowledge require different management strategies. This section discusses how to classify and manage different types of knowledge productively.

Inventory Key Knowledge

If you don't know what you're trying to manage, you can't manage it. The failure of some knowledge management efforts results from the absence of an explicit knowledge inventory. This inventory should list what must be known to improve each value-producing activity. Creating such an inventory can be tedious and long, but mechanically it's pretty simple. For the core value-producing activities (see Step 1 on Page 16), take the understanding of how knowledge leads to value (see Step 3 on Page 17), and then list what must be known to create the value and who must know it.

Tacit knowledge is difficult to share.

When the inventory is complete, you'll have explicitly identified your organization's most valuable knowledge. You can then begin to manage it. You'll likely be surprised by how much knowledge people need to do their work, and you'll have a clear idea of which knowledge adds the most value. You can then begin to understand what is necessary to manage your most valuable knowledge. Just like trying to manage activities at a warehouse, you need a detailed understanding of what you're trying to manage in order to be able to manage it.

Identify the Knowledge Type, Define Its Type, Describe Its Users

It's intuitive to a child that there are different types of knowledge. Knowing someone is not the same as knowing how to speak a language, knowing how to read a repair manual, knowing how to play hockey, or knowing when your spouse is in a bad mood. But for some reason, it's a relatively common knowledge management pitfall to treat knowledge as a monolithic, uniform entity (i.e., "We put all our knowledge on the Web"). In reality, there are different types of knowledge, and each type requires a different management approach.

Since the first Babylonian libraries, people have been studying how to define and classify knowledge—and that's only written knowledge. Unless you understand the type of knowledge at hand, you won't be able to build a reliable way to put that knowledge to work. Much of the confusion about just the definition of knowledge management is really confusion caused by the fact that different types of knowledge require different management techniques. Appendix B includes important details about three different ways to classify knowledge: Is the knowledge tacit or explicit? Is it relevant to a group or to individuals? Is the knowledge static or dynamic?

These distinctions are important because each type of knowledge requires different management techniques, just like different types of activities—a soccer team, a team of lawyers, the military, and an assembly line—require different management techniques.

Appendix B provides a deeper introduction to these concepts, supporting the idea that value is created when shared knowledge is used. Understanding how readily knowledge can be shared is one important distinction; that is, is the knowledge explicit or tacit? Explicit knowledge can be shared relatively easily, but it takes time and effort to make tacit knowledge explicit. Tacit knowledge needs to be either made explicit before it can be shared or transferred through time-consuming mentoring or apprenticeship schemes.

Making knowledge explicit in some kinds of media makes it easy to share. Making it explicit through mentoring (e.g., "Watch how George does this") is expensive and slow. Some knowledge is really only useful when it's explicit. For example, because no one can really remember every little detail, a complex maintenance procedure must be explicit. Some knowledge needs to be tacit, or it won't be useful. For example, a cardiac surgeon can't interrupt an operation to look up the different parts of the heart.

Unless you understand the type of knowledge at hand, you won't be able to build a reliable way to put that knowledge to work.

- Understanding how much time and effort is required to extract and verify tacit knowledge is key to estimating the cost of a knowledge management effort.
- Understanding how explicit knowledge might be leveraged by replicating its use is key to understanding its value.

There isn't space in this brief introduction to completely cover the management implications of the other important types of knowledge—individual vs. group knowledge or static vs. dynamic knowledge. Again, Appendix B presents a few of the details. But just as tacit and explicit types of knowledge should be managed in different ways, knowledge that only an individual needs to know should be managed differently from knowledge that a group must know. It almost seems too obvious, but teaching someone to play the violin is different than getting an orchestra to perform. A knowledge management approach needs to take factors like this into account. Without explicitly understanding this difference and managing it appropriately, an organization won't manage its knowledge properly.

Similarly, whether knowledge is static or dynamic (i.e., whether it needs to be updated often to be useful) is another important consideration when designing a knowledge management approach. If you treat dynamic knowledge as if it were static, you'll quickly find that your reservoir of experience is hopelessly out-of-date. Dynamic knowledge has a shelf life; if it isn't kept fresh, it will soon rot. Many knowledge management efforts fail because they use an approach that works well for static knowledge in dynamic situations.

Context Is Key

Finally, all types of knowledge have contexts in which they are useful and contexts in which they are worthless. Semiconductor physics aren't useful on a desert island, and most city dwellers don't need to know how to plant crops. Knowledge management should place knowledge in the proper context so that it can be found and used easily. Knowledge that is out of context is just undifferentiated information that will be misapplied if it is used at all. Making sure that the knowledge will be available to the person who needs it in the context of a specific job is a hallmark of successful knowledge management projects. Too many knowledge management efforts focus on making it easy to search for information. Information should be pushed to users, in context, and without overload. Information should not be kept in a vault.

How to Manage and Renew a Group's Knowledge

Dynamic knowledge has a shelf life, if it isn't kept fresh it will soon rot.

So far, this paper has outlined an approach to identify the knowledge that adds the most value (so you can focus on the most valuable) and to distinguish between major types of knowledge (so each can be managed appropriately). Following this approach allows you to inventory and classify your most valuable knowledge. With this foundation, let's discuss how to manage it. This section describes what must be done to share, use, and improve your knowledge or reservoir of experience.

You need a reliable approach that will allow people in the organization to have the most up-to-date knowledge available when and where they need it. You also need to have all types of knowledge under effective control (i.e., managed) and be assured that the knowledge is continually valid (i.e., renewed).

Building Organizations That Can Use Knowledge

Fortunately, a set of principles called "adaptive control theory" provides a foundation for how to reliably improve performance by managing and renewing knowledge. Appendix C introduces the concept of adaptive control and shows how an organization—if it can accomplish six important actions—can manage and renew its knowledge to improve performance. Refer to Appendix C for details and justification for what's presented next.

Briefly, the six actions an organization must accomplish to manage and renew knowledge to improve performance in a dynamic environment are:

1. Define goals linked to the bottom line to ensure an organization's energy is channeled in productive ways.

2. Access a reservoir of experience to benefit from past successes or failures.

3. Ensure that actions are directed at meeting specific goals to turn intentions into reality.

4. Monitor performance accurately to sense performance gaps.

5. Remember how and why decisions are made to identify the root cause of success or failure.

6. Improve the accessible reservoir of experience to benefit from experience next time.

Appendix C shows that these actions are required to achieve performance in a changing environment. Organizations that can accomplish the first three actions will have knowledge under effective control: Everyone will have the knowledge he or she needs. Organizations that can accomplish the last three actions will be able to ensure that their experience is continually improved in the face of experience.

Without systematic ways to accomplish these last three actions, an organization's knowledge management approach will become outdated. In the days of paper manuals,

people used the excuse, “The manual was good, but things have changed, so we don’t use it any more.” An online manual will suffer the same fate if there isn’t a reliable way to ensure that the information it contains is up-to-date.

If you’re like me, you might be asking: “Who doesn’t want to manage and renew knowledge? How do you know there are only six actions? How can you be sure that doing the six things will improve performance?” When people say things like marketing has four Ps (product, price, place, and promotion), I often wondered why there were not three P’s and an M or two R’s, an M, and three S’s. Why four P’s?

Technology can make explicit knowledge available but it can’t make it be used.

The point is that to benefit from experience, you need to know exactly what needs to be done. The six learning actions create a simple outline of exactly that. The six actions required to build an organization that uses knowledge effectively were garnered from the study of systems dynamics, which is a science created to achieve performance in the face of changing circumstances. For a detailed explanation, see Appendix C.

The six actions describe what needs to occur for an organization to capture, share, use, and improve collective know-how. An organization that performs these six actions will achieve these goals; an organization that leaves even one out will not. So what does it take to ensure that people in your organization perform the six actions? As you may have guessed, it’s not exclusively an information technology problem.

Information Technology Is an Enabler, not a Solution

Information technology is a means of implementing and sharing explicit knowledge, not a guarantee that it will be used. Information technology is an important enabler, but it’s not the solution to getting experience captured, shared, used, and improved. Those who suggest that all you have to do is “model your processes in software” or “put all your knowledge on the intranet” have missed the point.

Knowledge is valuable only if it drives action. Getting the information to the right person is one thing; getting the information to drive action is something else altogether. A great Web-based, corporatewide, lessons-learned database is no good if people don’t or can’t use it. Take “smoking causes cancer” as an example. It’s a bit of information that’s based on valuable experience. Technology has broadly disseminated that information, but people’s behavior hasn’t necessarily changed.

Technology can make explicit knowledge (words, pictures, sounds) more widely available than ever before. It’s an effective and reliable way to remember things you would probably otherwise forget. Technology can help people find what they need and even push available knowledge to those who don’t even realize that they need it. It can filter out unnecessary information so that what’s presented is in context without information overload. Technology is a critical enabler, but by itself, it can never guarantee action.

Technology isn’t the entire answer, but it is necessary. If your organization doesn’t have the appropriate mechanisms to capture, share, use, and improve knowledge, then it will have a difficult time improving performance. However, even if your company has the best software tools, if your people do not care about sharing what they know or the organization’s structure blocks the flow of information, then your organization will not perform as well as it can.

Making Knowledge Management and Renewal a Reality

Building an Organization That Uses Knowledge to Perform: The Matrix

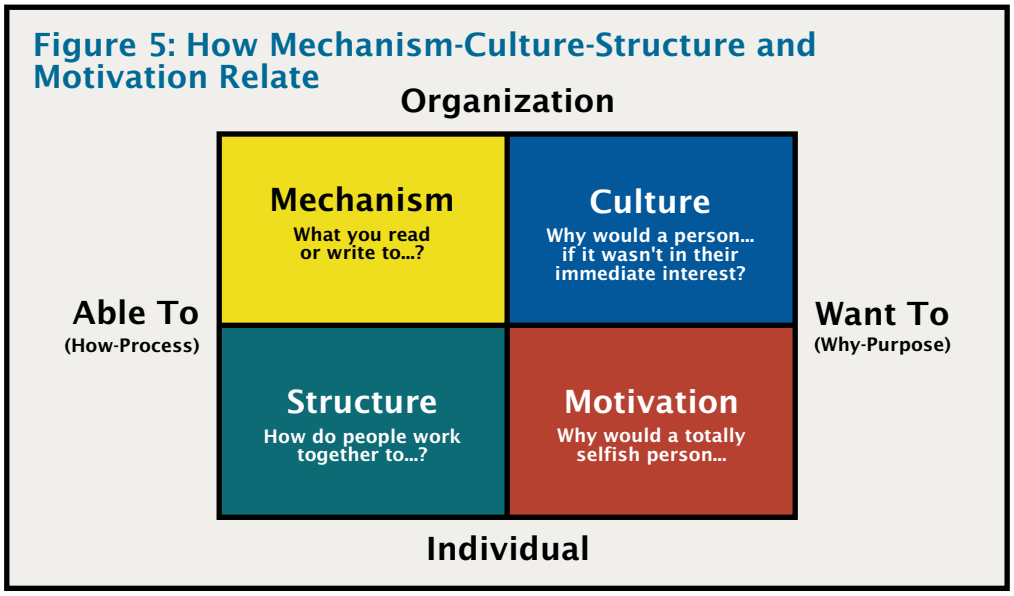
Miss one of these dimensions and knowledge won't be managed or renewed.

If technology isn't the solution, then what is? What does it take to build an organization that has the six actions built in as a normal part of work? Appendix C shows that if the six basic actions reliably happen, an organization will use its knowledge to perform as well as it possibly can. But what does it take to make those actions happen? The problem seems complicated. This section and Appendix D provide a practical way to make sense of all this. Any solution needs to ensure that the six actions occur.

The organization, as a whole, and every individual within the organization needs to be able to—and want to—capture, share, use, and improve the organization's collective experience base.

An organization is able to if it has a mechanism. An organization will want to if it has the right culture. Individuals in the organization will be able to contribute if they are part of the right structure and will want to if they have the right motivation. The matrix in Figure 5 outlines four dimensions of an effective knowledge management implementation: mechanism, culture, structure, and motivation. Miss one of these dimensions, and knowledge won't be managed or renewed.

Figure 5: How Mechanism-Culture-Structure and Motivation Relate



Creating an Organization to Accomplish the Six Actions

Appendix D covers each dimension separately in some depth, but keep all four in mind. To become a learning organization and to profit from knowledge management, it's critical to think holistically and address all four dimensions simultaneously. Imagine a beach ball with four colors, each color representing one of the four dimensions. Holding the ball still allows you to see each of the colors distinctly and clearly. Now spin the ball. The colors blur together and become difficult to distinguish. That's the reality of the four dimensions; they are all present and operating at the same time.

If you want to accomplish any one of the six actions, you need each of the four dimensions. For example, to "define goals linked to the bottom line," you need a goal definition process (mechanism), all the stakeholders involved (structure), shared belief in the purpose of the organization (culture), and for each person to be committed—to feel that "I win when the team wins" (motivation). If you neglect one of the dimensions, you won't be able to accomplish any of the six actions.

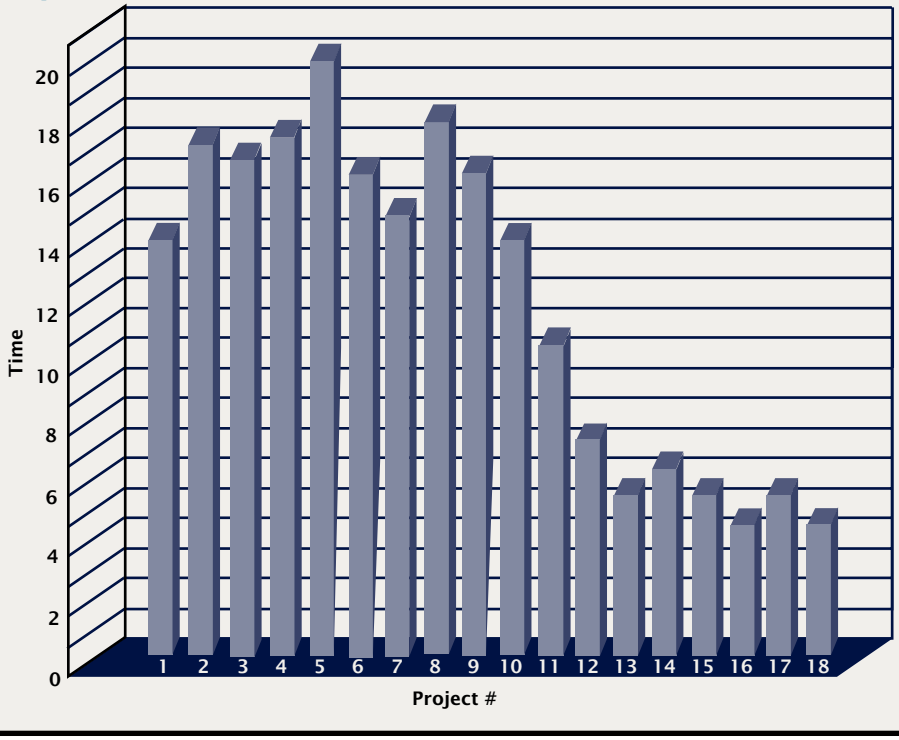
Each of the six actions needs to have all four dimensions functioning, or a bottleneck will keep the organization from benefiting from its knowledge to the fullest.

Skipping steps creates the illusion of speed but never produces the desired result.

Conclusion: Where to Start

Royal Dutch Shell's Arie P. de Geus said, "Learning faster than your competitors may be the only sustainable competitive advantage." Millions of Web pages on knowledge management and organizational learning show that people have faith that it can help. But faith alone isn't enough. People sometimes make the mistake of thinking, "Our president is a big believer, so we don't need to quantify our knowledge management efforts." Faith may get you into heaven, but in the cold world of business, it won't help people keep their knowledge management jobs. You need more than faith in knowledge management; you need a proven and practical way to harvest value from knowledge assets.

Figure 6: Implemented Dedicated Learning Effort in Operations



In business, things that prove they can make money have a way of staying around. Knowledge management will be a short-lived fad if it can't prove its value. Too many organizations start out on the wrong foot by failing to direct their knowledge management effort toward something that actually builds value. It doesn't have to be that way. You can prove the value of knowledge management if you take the time to build a business case that quantifies incremental value by reducing investment, shortening lag times, increasing return, or lengthening productive life.

There is a physics for managing in the face of an unknown or changing environment.

Valuing is one thing; doing is another. There is a physics for managing in the face of an unknown or changing environment. There is a way to ensure that people in an organization have and use the knowledge they need to perform. Specific actions are required to ensure that an organization can capture, share, use, and improve its collective experience. Skipping steps creates the illusion of speed but never produces the desired result. An organization can ensure that it profits from experience if it inventories and classifies its valuable knowledge and then designs and implements a reliable way to manage and renew that knowledge. Ensuring that the six actions outlined in this paper occur is a reliable way to manage and renew knowledge.

Managing and renewing valuable knowledge is not a software problem. Unless an implementation, in a balanced way, addresses the mechanical, structural, cultural, and motivational factors that deal with the use of knowledge, it will fail. The goal of all this is to build an organization in which you cannot help using the latest and best knowledge because it's woven into the fabric of normal work. To succeed, this needs to be the ongoing, organic way the organization operates. It's not easy, but it is possible, and it's very, very valuable.

About the Author

J. Ford Brett
Senior executive advisor
Frontline Group Organizational Learning

J. Ford Brett's technical background and work experience qualify him as an authority in the areas of process and project performance. He is a recognized expert in the area of knowledge management. Mr. Brett is now a senior executive advisor to Frontline Group Organizational Learning, which helps Fortune 100 organizations manage and improve processes worldwide.

Frontline was awarded the 2000 Phillip B. Crosby Award for quality in global competitiveness from the American Society for Competitiveness. The award honors Frontline Group Organizational Learning for its work in global competitiveness through quality in knowledge management, best-practices transfer, and operations improvement. But perhaps the most impressive honor comes from client recommendations, such as this one:

"Of all the initiatives we've undertaken at Chevron during the '90s, few have been as important or rewarding as our efforts to build a learning organization... . The most exciting new example has been the adoption of the (Frontline Group) Organizational Learning Systems®. In drilling, it uses a simple software tool to capture lessons from the first wells in a new area, and then it helps you use that knowledge to drill the rest of the wells faster and cheaper. We've seen costs drop by 12 percent to 20 percent and cycle time reduced by 40 percent."

—Ken Derr, former chairman and CEO of Chevron

As Ken Derr's quote shows, keeping organizational learning simple is an important part of making it part of normal work. Frontline Group Organizational Learning provides the information personnel need in the context of the job at hand.

"Discover what works, and remember how to keep doing it; and figure out what doesn't work, and never do that again," says Mr. Brett. The Society of Petroleum Engineers honored him in 1999 as a Distinguished Lecturer. He has spoken professionally and conducted scores of seminars in more than 25 countries on six continents.

A registered Professional Engineer and a certified Project Management Professional, Mr. Brett has been granted more than 25 U.S. and international patents, has authored or co-authored more than 25 technical publications, and has recently completed a book, "Organizational Learning—The 24 Keys to High Performance." For his work on improved oil-well drilling techniques, he was also honored in 1996 with a nomination for the National Medal of Technology, the U.S. government's highest technology award.

Mr. Brett holds a B.S. in mechanical engineering and physics from Duke University (where he was elected to Phi Beta Kappa), an M.S.E. from Stanford University, and an M.B.A. from Oklahoma State University. Mr. Brett is also an Eagle Scout.

If you need additional information, contact built2learn@frontline-group.com.

About Frontline Group

We create measurable results by unlocking the power of your workforce to learn, adapt, and perform. Frontline provides business and knowledge management solutions that strengthen and build upon organizational success. In essence, we foster and drive dynamic, self-directed learning environments.

The company is based in Nashville, Tennessee, with offices throughout the United States, Canada, and the United Kingdom. Frontline Group Organizational Learning is located in Tulsa, Oklahoma. Frontline's 500 employees offer products and consulting services to the financial, high-tech, telecommunications, and industrial and manufacturing industries.

Frontline focuses on improving a company's ability to manage and capitalize on knowledge. We provide solutions ranging from multiple technology-based delivery systems to classroom training and management consulting. Frontline creates content, tracks individual development, uncovers organizational best practices and gaps, and shapes employee competencies to continually improve performance and profitability. Frontline monitors and measures results. Clients know the return on their investment because we can prove it.

Frontline has financial backing from GTCR Golder Rauner LLC, a leading private equity investment firm that manages $4 billion in capital.

Contact Us

Frontline Group
111 10th Ave. S., Suite 400
Nashville, TN 37203
Toll-free: 877-468-1010
Phone: 615-301-2100
Fax: 615-301-2101

Frontline Group
Organizational Learning
4111 S. Darlington Ave., Suite 700
Tulsa, OK 74135
Toll-free: 800-317-6424
Phone: 918-384-2600
Fax: 918-384-2652

www.frontline-group.com
built2learn@frontline-group.com

Appendix A:
How to Build a Knowledge Management Business Case

Creating a business case for knowledge management is similar to creating a business case for anything—with one subtle difference. Creating a business case for a factory, for example, requires an understanding of how physical assets affects cash flow. What will the plant cost? How much can it make? What will its products be worth?

Valuing knowledge management requires an understanding of how knowledge impacts cash flow.

To make a sound decision about investments in knowledge management you need to understand how knowledge affects cash flow. What will it cost to codify the organization's knowledge? How much better will it perform with better knowledge? What will the improved performance be worth? Basically, to make a sound decision about investments in knowledge management, you need to build a business case that tests how managing knowledge will add to the fundamental value-generating activities of your organization. The four steps below outline how to create a knowledge management business case.

Build a Business Case

Step 1: Inventory Your Organization's Value-Producing Activities
Some real examples of these might are building a cell phone tower, evaluating a commercial loan, opening a restaurant, hiring and training new sales associates, building an offshore oil platform, or developing a software product. Each activity involves an upfront investment in anticipation of future income. Most organizations have many such activities.

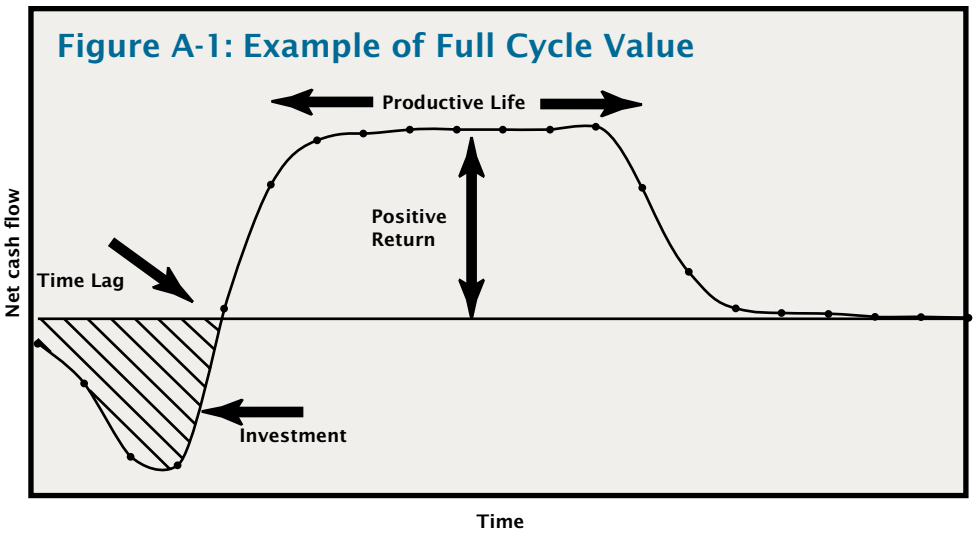
Step 2: Quantify Business-as-Usual Cash-Flow Profiles
Quantify how each of these activities yields positive economic return to your organization. To really understand how activity links to value, you need to be able to describe each activity's full-cycle economics.

You need to be able to plot the *before-improvement* cash flow vs. time for each core activity. Each activity will have its own typical cash-flow profile.

The full-cycle economics of any of the examples listed above would follow a similar pattern to the one shown in Figure A-1:

- **Investment:** Hire a new sales associate, build a restaurant, or drill an oil well.
- **Time lag:** Time required to train, build, or drill.
- **Positive return:** Income exceeds cost as the associate makes sales, the restaurant sells food, or the platform produces.
- **Productive life:** Period of time until the associate moves on, the restaurant closes, or the oil runs out.

How can you value something if you can't quantify how it produces return?



Step 3: Quantify How Knowledge Management Will Add Value

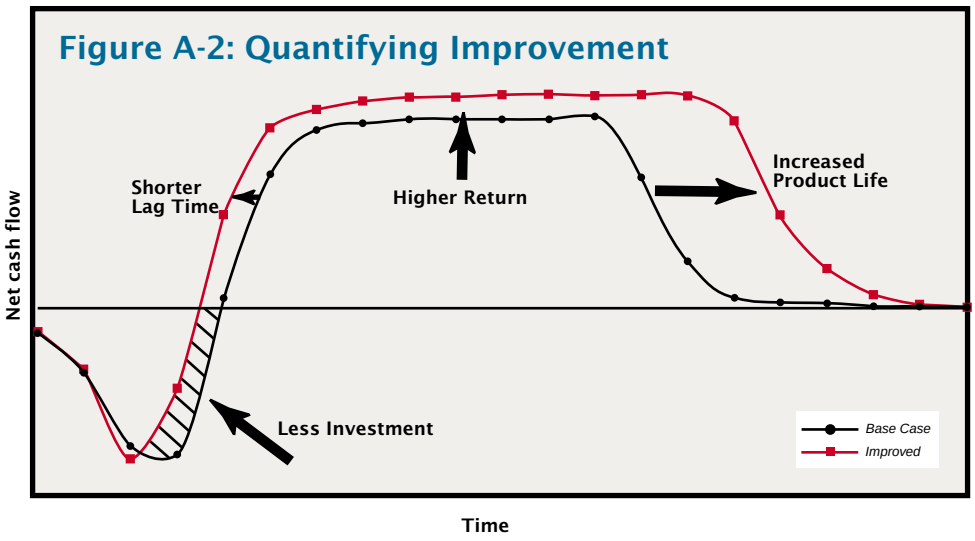
Develop an understanding of how improving knowledge management could increase key activity value. Calculate, with reasonable certainty, how knowledge management would improve each activity's cash-flow profile. Answer the following question: "How will better use of knowledge reduce each activity's investment and time lag and/or increase its positive return or productive life?"

Knowledge management investments should be evaluated using these same full-cycle economic criteria. Investment, time lag, profit, and productive life should all be considered. For example, you should consider the impact that your knowledge management efforts will have on each of the following:

- **Investment.** How will an up-to-date online product reduce the cost of training new sales associates?
- **Time lag.** How will access to global best practices reduce cell tower construction times?
- **Positive return.** How will faster dissemination of the latest technology make wells more productive?
- **Productive life.** How might a better understanding of how software is used lengthen a given application's sales life?

Figure A-2 on the following page shows an example of a baseline and improved cash-flow profile.

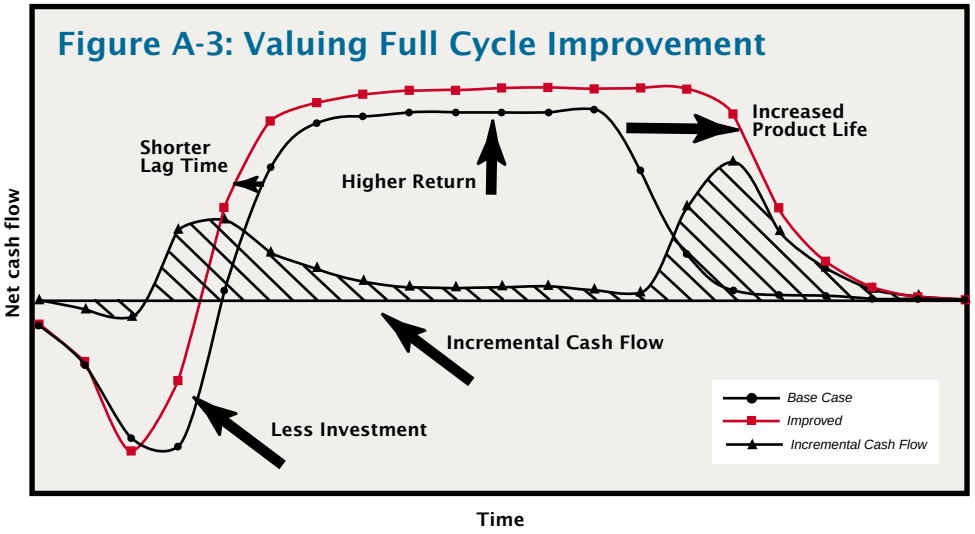
If you can estimate how knowledge affects cash flow, it is relatively simple to value knowledge management.



Step 4: Calculate the Net Value of Incremental Cash Flows

Finally, calculate the net value of your knowledge management improvement. You should be able to predict a knowledge management effort's cost and value. Estimating an effort's cost is relatively straightforward. How much will it cost to develop and implement? What will it cost to run on an annual basis? Most knowledge management initiatives probably make a passing grade in estimating cost, but many fail at estimating value. Given your estimates of how knowledge affects your organization's cash-flow profile, it will be relatively easy to quantify the effort's value. Knowledge management is worthwhile when the incremental cash flow between the business-as-usual case and the "better knowledge management" case more than justifies the cost of the effort, as demonstrated in Figure A-3.

This figure shows how relatively simple improvements in the cash-flow profile can result in huge returns from the knowledge management effort as a whole. A simple-to-use tool that is based on this approach can help you quantify the value of knowledge management. The tool, called the Knowledge Value Calculator, is available at www.built2learn.com. Learn to value knowledge management, and explore three example situations: a management change effort, software development process, and an oil field development. These examples show that returns on knowledge management investments can easily be 300 percent to 500 percent.



Appendix B:
How to Manage Different Kinds of Knowledge

Different Types of Knowledge Require Different Management Strategies

Distinguish among important types of knowledge and develop appropriate ways to manage each type of knowledge.

You can't manage something if you don't know what it is, and you can't manage something if you treat different things as if they were the same. To manage knowledge effectively, you have to know what type of knowledge you are trying to manage and then establish a way to capture, share, use, and improve that knowledge. This appendix will help you distinguish among important types of knowledge and develop appropriate ways to manage each type of knowledge.

Other parts of this paper describe how to identify what knowledge is valuable. This appendix assumes that you have identified the knowledge required to perform the organization's key activities. The next step is to describe where knowledge is created and explain how it is used. One important part to being able to do this is to understand what type of knowledge you are dealing with. Knowledge can be broadly classified into groups of how easily it is shared (tacit vs. explicit knowledge), how many people need to know it (group vs. individual knowledge), and how often it needs to be updated (static vs. dynamic knowledge). Because each type of knowledge needs to be managed in a different way, understanding what type of knowledge is most valuable is critical for being able to properly use that knowledge.

Is the Knowledge Tacit or Explicit: How Easily Is It Shared?

The most important way to classify knowledge is by its degree of documentation. How easily is it shared? Explicit knowledge exists in a form that can be transferred to others. Examples of explicit knowledge are recipes, exercise videos, sheet music, design drawings, or a procedure in a maintenance manual. Explicit knowledge is more readily put into action because it can be shared without personal interaction, but it carries the risk of going out-of-date if it's not updated regularly.

Tacit knowledge is knowledge that does not currently exist in a documented form. Tacit knowledge that can't be made explicit at all is sometimes called "implied knowledge." Implied knowledge can be shared only through watching an accomplished expert, by hands-on trial and error, or sometimes by listening to stories. Examples are painting a picture, reading a jury, or sensing when your spouse wants to be left alone. Tacit knowledge tends to be local as well as stubborn because it is not found in manuals, books, databases, or files. Some tacit knowledge is oral and can be shared around the water cooler. You can spread this kind of tacit knowledge by meeting and telling stories or by undertaking a systematic effort to ferret it out and make it explicit.

Some kinds of tacit knowledge could be made explicit if someone takes the time to document them. Examples are tips for handling a specific customer, answers to questions that might be asked after a presentation, or how a machine sounds right before it's about lose its bearings. These types of things could be documented in writing, on tape, with pictures—any number of ways. Whether such types of knowledge are worth documenting depends on how much they will cost to document; how valuable they will

be when shared; and, most important, how often they will be used when shared. To create a cost-effective plan for leveraging knowledge assets, you will need to know if the valuable knowledge in your organization is currently tacit or explicit.

Two important principles of tacit-explicit knowledge are as follows:

1. All knowledge starts out as tacit knowledge. An individual always discovers something for himself before it's ever explicitly documented.

2. There is always more tacit knowledge than explicit knowledge. People know more than they can ever completely write down.

Understanding how explicit knowledge might be leveraged is key to understanding its value.

Value is created when shared knowledge is used. Explicit knowledge can be shared relatively easily, but it takes time and effort to make tacit knowledge explicit. Tacit knowledge needs to be either made explicit before it can be shared or transferred through time-consuming mentoring or apprenticeship. Making knowledge explicit in some kind of medium makes it easy to share. Making it explicit through mentoring (e.g., "Watch how George does this") is expensive and slow. Some knowledge is useful only when it's explicit. For example, because no one can really remember every little detail, detailed maintenance procedures must be explicit. Some knowledge needs to be tacit, or it won't be useful. For example, a cardiac surgeon can't interrupt an operation to look up the different parts of the heart. Understanding how much time and effort is required to extract and verify tacit knowledge is a key part of estimating the cost of a knowledge management effort. Understanding how explicit knowledge might be leveraged, by replicating its use, is key to understanding its value.

Individual vs. Group Knowledge: Does More Than One Person Really Need to Have This Knowledge?

A second important way to classify knowledge is by the degree to which it describes individual or group know-how. Individual knowledge (sometimes called "job-level knowledge") is know-how that requires the action of only one individual. Examples are typing a letter, tying shoes, adding numbers, or buttering bread. Group knowledge (sometimes called "process-level knowledge") is know-how that requires the simultaneous action of more than one person. Examples are running an assembly line, writing a large software program, launching a product nationwide, or running a football play. Here are two important principles of group-related know-how:

1. The importance of managing group knowledge grows exponentially with the size of the team: The bigger the group, the more important managing this knowledge becomes. (The number of possible interactions in an organization varies as 2^{n-1}. A group of four people has eight different possible interactions, a group of 10 has 512, and a group of 16 has 131,072.)

2. Validating group knowledge is a much longer and more difficult process than validating individual knowledge: It's harder to get an orchestra to play than a single violin player.

Businesses normally have a reasonable interest in ensuring that both group and individual knowledge are managed properly. It's important to recognize the distinction

between individual and group knowledge because they should be developed and managed in different ways.

Static vs. Dynamic: How Often Does the Knowledge Need to Be Updated?

Dynamic knowledge is more expensive to maintain and often involves extensive validation procedures.

A final important classification of knowledge relates to how often the knowledge should be updated. Static knowledge evolves slowly and is highly repeatable. Examples are maintenance procedures, recipes in a cookbook, and sheet music. Dynamic knowledge evolves rapidly and needs to adapt to a specific situation. Examples are how to properly market a new product, how to document best practices in a rapidly changing technical field, and how to staff a large project team. There are several important points concerning dynamic-static knowledge:

1. A key characteristic of dynamic knowledge is timeliness: Dynamic knowledge has an expiration date; if it isn't adapted or maintained, it will rot.

2. Both types of knowledge require validation ("Is this true?") and mediation ("Where did this information come from?"). With unmediated information, you can't distinguish best practices from rubbish. Predictions of a comet passing the Earth are handled differently if they come from a respected cosmologist than from an astrologer.

To properly manage dynamic knowledge, an organization must have ways to quickly and reliably validate and mediate the knowledge. Dynamic knowledge is more expensive to maintain and often involves extensive validation procedures. The design of a knowledge management approach needs to take these factors into account.

Different Ways to Manage Different Types of Knowledge

Knowledge management is about ensuring that every individual in an organization is able to—and wants to—use the knowledge he or she needs to perform at the highest level. It's obvious that valuable knowledge can sometimes be transferred in writing (e.g., a detailed design manual). It's also just as obvious that, sometimes, written instructions just won't do, and watching an expert is the only way (e.g., shoeing a horse). Sometimes knowledge ages quickly, and specific steps must be in place for it to be renewed. Sometimes knowledge needs to be widely distributed for it to be effective. Table B-1 summarizes the different types of knowledge and gives examples of each. Effective knowledge management programs explicitly define what type of knowledge is most valuable and develop ways to manage and renew that knowledge.

Figure B-1: Different Ways to Manage Different Types of Knowledge

Type of Knowledge		Static — Evolves slowly or is highly repeatable		Dynamic — Evolves Rapidly or needs to adapt to a specific solution	
		Individual — Requires action by an individual to be useful	**Group** — Requires simutaneous action of many to be useful	**Individual** — Requires action by an individual to be useful	**Group** — Requires simutaneous action of many to be useful
Tacit Knowledge — Not documented in a form that can be transferred	How to Improve Performance	Individual hands-on training and practice	Simulation mentoring/ apprenticeship program	Team training, practice, and role play	Simulation, mentoring/ apprenticeship program
	Ways to Manage Knowledge	Coach to build specific skills and behaviors	Real time observation and coaching by a "Sage"	Coach to build effective Teamwork	Real time observation and coaching by a "Sage"
	Examples — *Software Company*	*Typing*	*Knowing when it is OK to "blow off steam"*	*Writing Software specifications*	*Holding effective design reviews*
	Examples — *French Restaurant*	*Mixing a souffle so that it doesn't fall*	*Keeping appropriate aura of snootiness among the wait-staff*	*Dealing with a troublesome customer*	*Busing, serving, and seating parties on a busy night*
	Examples — *Factory*	*Laying a weld belt*	*Working together to install a complicated part*	*Hearing that a machine "doesn't sound right"*	*Knowing when to slow down an assembly line*
Explicit Knowledge — Documented in a form that can be transferred	How to Improve Performance	Use the appropriate "checklist" for the situation at hand	Able to find and use the most up-to-date "Checklist for the situation at hand	Have team effectively use the right process/plan for the situation	Able to find and use the most up-to-date "checklist" for the situation at hand
	Ways to Manage Knowledge	Provide the right "checklist" for the situation at hand	Provide the right "Checklist" for situation at hand and keep it up-to-date	Provide the right plan for situation at hand, and ensure people use it in concert	Provide the right plan for situation at hand, ensure people use it in concert and keep it up-to-date
	Examples — *Software Company*	*Compiling a program*	*How to code in a software language*	*Executing a software testing procedure*	*Scheduling a software development team*
	Examples — *French Restaurant*	*Making a dish using a cookbook recipe*	*Dress code for waiters, waitresses, bus boys, and maitre'd*	*Specifying ingredients for a catered dinner for 100*	*Market prices posted on the menu for lobster and other expensive items*
	Examples — *Factory*	*Oiling a particular machine based on Maintenance Checklist*	*Descrbing the steps to construct a machine*	*Determining how many parts needed on hand to fulfill a particular day's quota*	*Optimizing production schedule for a new suite of products*

Appendix C:
How to Manage and Renew Knowledge in a Dynamic Environment

The Origins of the Six Actions: The Relationship Between Systems Dynamics and Using Knowledge Effectively

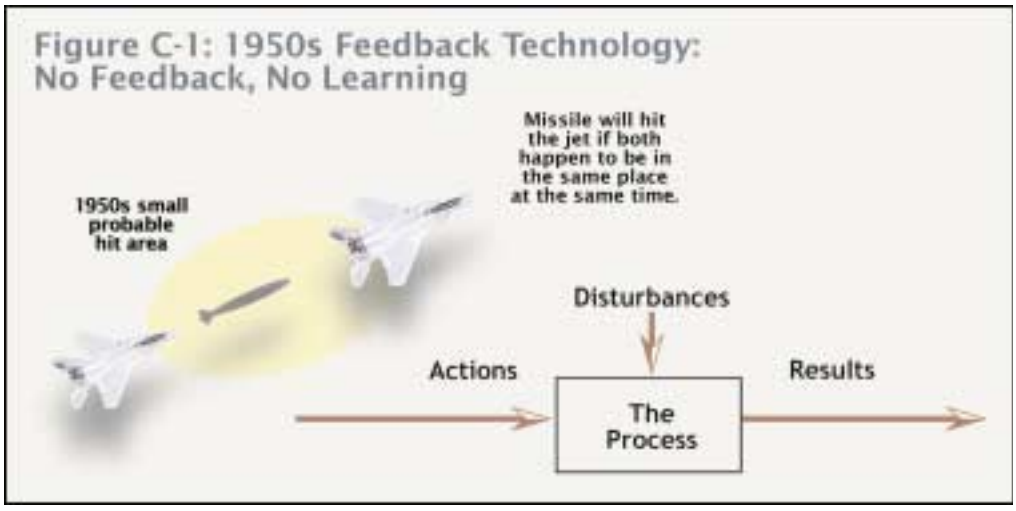
System dynamics describes the six actions required to manage a dynamic environment.

The idea of system dynamics, which was the method used to create modern air-to-air missiles, creates an excellent parallel that shows the necessity of the six learning actions in modern knowledge management. The following outline of three stages in the evolution of missiles shows the drastic differences between hit-or-miss knowledge management vs. the system incorporating our six actions.

Missile Example 1: Point and Shoot

The missile technology of the 1950s can be described best as point and shoot: The goal is to shoot down an enemy aircraft from the air. Each time, a pilot has to ensure that his jet is lined up exactly behind the enemy's jet. The missile or bullet is fired and travels exactly as aimed. The bullet does one thing: It goes directly forward (Figure C-1). These projectiles cannot adapt if the target changes direction. If the enemy banks a turn as the bullet is fired, the bullet will miss. These outmoded missiles cannot react to changing situations.

The effectiveness of this system depends entirely on the relative skill of the two pilots, the relative speeds of the projectile and the enemy aircraft, and luck. Consequently, the resultant probable hit area is fairly small. The pilot can get the result he wants only if he does things perfectly and nothing disturbs the situation before he hits the target.



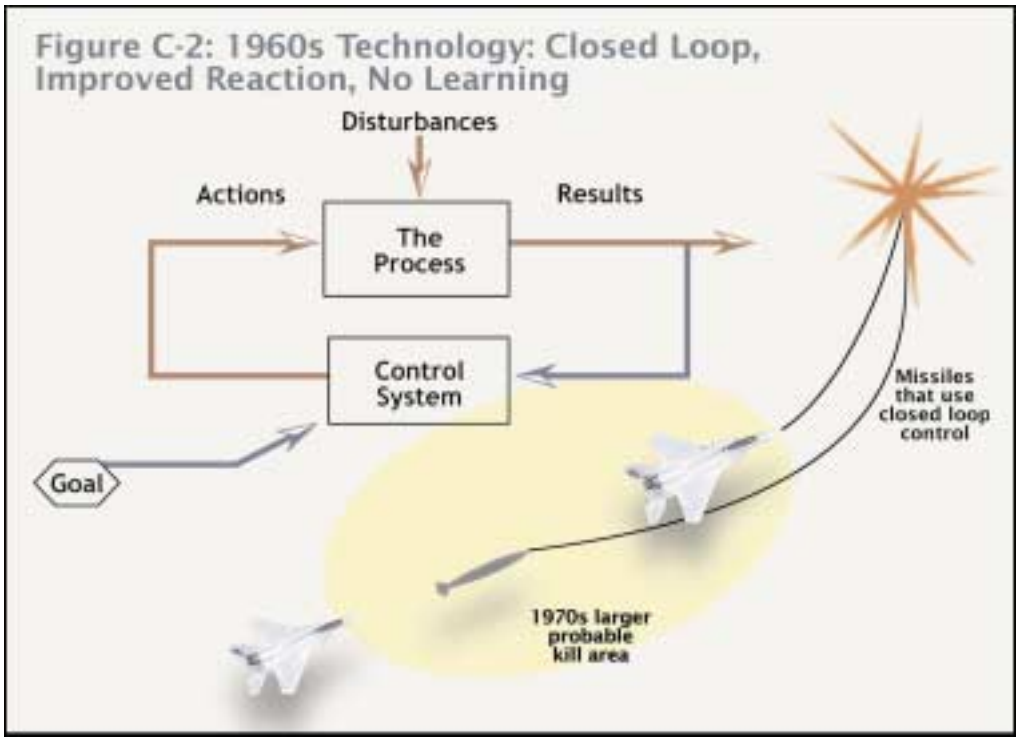
Missile Example 2: How to Follow the Target

In the 1950s, missiles could not follow the target; they could only go straight. This technology succeeds only if nothing changes. So in the 1960s missile designers created the next generation of missiles—missiles that used feedback control to follow their targets. Not surprisingly, the probable hit area was much larger.

Without feedback you can't follow a moving target.

The missiles of the 1960s used a closed-loop control system. A closed-loop control system uses feedback (i.e., measurements of performance) to change the way it behaves (Figure C-2). A familiar example of a closed-loop system is your home heating/cooling system. Ideally, your heating/cooling system is designed to fit the initial parameters (weather conditions, number of windows, etc.) of your house. The control system (thermostat plus heater/air conditioner) is chosen to take these factors into account and to keep your house within a certain temperature range. Houses in Chicago need different systems than houses in Dallas; big buildings need different systems than small houses. The right control system is determined by the process (e.g., building) and environmental disturbances environment (e.g., temperature range) it is meant to control.

Missiles that use closed-loop control are much better than point-and-shoot missiles because they can follow the target. That means that you can achieve your goals under a wider range of situations, and your probable hit area is much larger. These missiles are able to follow a target because they do three things: Define a goal, measure performance toward that goal, and ensure that their actions are directed at meeting that goal. The missile follows the target because it does these three steps repeatedly as it flies.



Closed-loop control systems work well, but only when (1) you have a good understanding of the process you're trying to control, (2) that process doesn't change, and (3) you can be sure that the outside disturbances are bounded. If, for example, you add a sunroom to your house, then you have changed the process. As a result, your existing heating/cooling system will probably not be up to the task.

Engineers design closed-loop systems to fit specific situations. If the process changes or if there are unexpected outside disturbances, the system will not work. With closed-loop systems, all the variables must be known. An unidentified outside disturbance will cause the system to malfunction. These types of control systems cannot adapt to changing conditions.

If the process changes a simple feedback control system won't work.

Because they can't adapt, closed-loop systems don't improve with time, which means they don't learn or change the way they behave. Once the model of the operating environment is set, there is no way to change it. If an operating environment is always as predicted, the system will work well. If the environment changes, then it won't. The problem for missiles is that you can never really know the environment: Missiles work differently at different altitudes, their weight changes as they burn fuel, and the fins never work as planned. Although the missiles follow their targets, they can hit their targets only if they move faster than the targets.

Missile Example 3: Lead the Target

In the 1970s, as aircraft became faster, missile designers made missiles that didn't just follow the target. Instead, missile designers used an approach called "adaptive control" to create missiles that could lead the target, or go to where the target was going to be. The principles that make missiles adapt can also apply to organizations.

Simple closed-loop missiles were made obsolete when engineers in the 1970s developed and implemented the principles of adaptive control. Adaptive-control techniques are now used to manage many different kinds of processes that change with time, including refineries and chemical plants. In fact, Milton Friedman received the Nobel Prize in economics for applying similar techniques to understanding the stability of the economy.

An adaptive-control guidance system heads the missile to where it predicts the target is going to be. The missile does not follow the target but uses the target's flight pattern at any given time to predict where the target is going. The missile combines that prediction with what it knows about its own capabilities to plan a trajectory that will achieve success in the shortest possible time. The missile predicts where the target is going and beats it to that point. If it can be smart enough to predict where the target is going, it can be successful without having to be so fast (see Figure C-3).

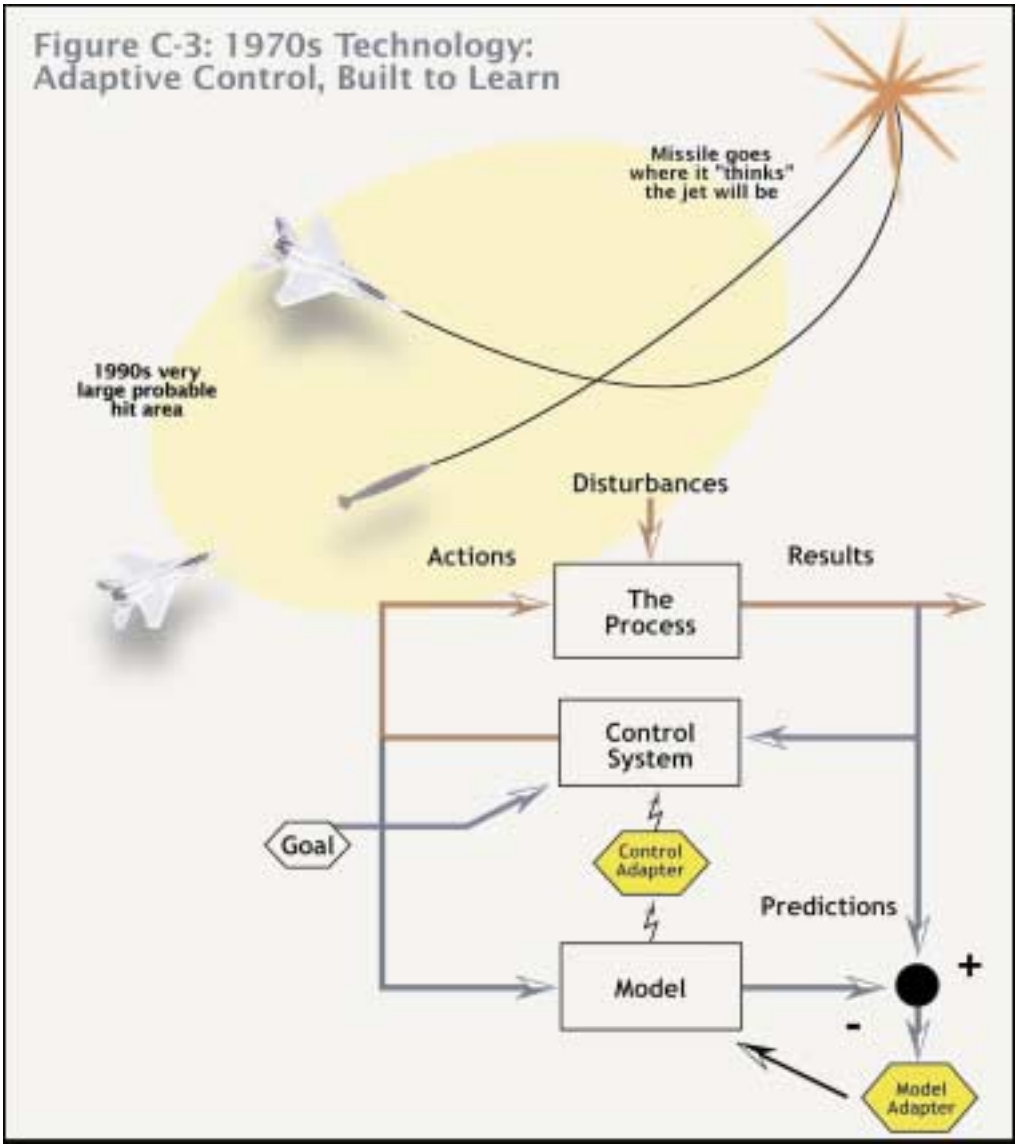
The cornerstone of the adaptive-control system is a model of the process it hopes to control. The model is the best educated guess (a prediction) of how that process works. Designers of these systems know that when outside disturbances occur or the process itself is unknown, the model will always be wrong. So they build a system that lets the model improve with time. With adaptive control, the model always gets better. It learns.

Missiles equipped with adaptive control take continuous measurements of the target's position, speed, and direction. Using measurement of the results, these smart missiles use knowledge of their experience (stored in the adaptive-control model) to predict the target's flight path. The adaptive-control system performs successfully even when conditions change.

Missiles built with the closed-loop control systems of the 1960s were stuck with their initial understanding of targets and their own behavior. If the conditions or the process changed, these missiles missed their targets. Missiles built with adaptive control know that this initial prediction will be wrong and use experience to build a better model. As the model changes, it can adapt to changing target conditions.

Adaptive control corrects errors in performance *and* errors in understanding.

The lesson that organizations can draw from this missile model is that it is possible to control physical processes that change with time. It is possible to manage disturbances even if you don't know what they will be. Missile designers can consistently achieve results in a changing environment with adaptive-control techniques.



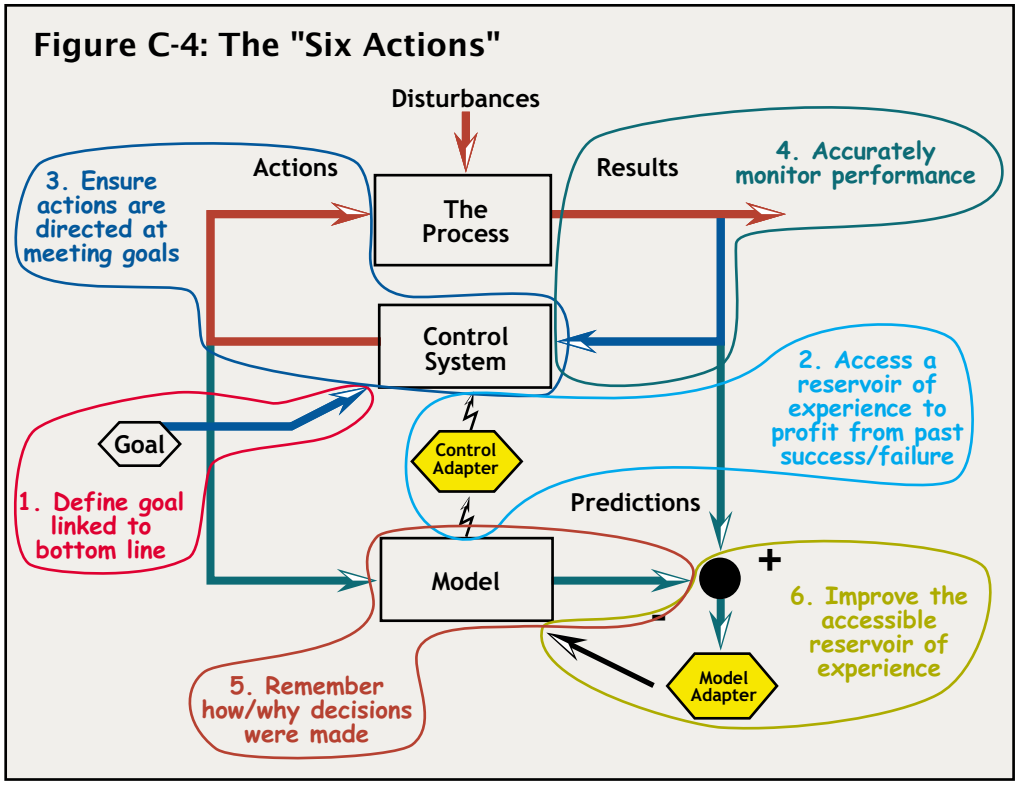
Adaptive Control

Adaptive control creates a framework to help organizations perform in changing environments. The structure of anything that learns or improves with time is the same as an adaptive-control system (see Figure C-4). It uses the six actions:

1. Define a goal linked directly to the fundamental objectives. For missiles, this means getting to the target as fast as possible; for organizations, this means reducing investment, shortening cycle time, increasing return, or lengthening productive life.

2. Access a reservoir of experience to benefit from past successes or failures. Missiles use a control adapter to take what is known in the model and use it to control the situation at hand. Businesses also need a way for people to know what works and what doesn't.

Focus on adding value; misdirected or ineffective actions consume resources that could be put to better use.



3. Ensure that actions are directed at meeting the specific goals. For missiles, this means a control system. For organizations, this means to plan work by focusing on adding value; misdirected or ineffective actions consume resources that could be put to better use.

4. Monitor performance accurately. For missiles, this means knowing their speed, the distance to the target, and so on. Businesses need to measure how they are progressing toward the objective. Otherwise, you are driving down a dark highway without any headlights on. Everything will seem OK until you hit something.

5. Remember how and why decisions are made. For missiles, the model does this. Businesses need to record what actions were taken (or not taken) and the reasons for the decisions. If you do not remember how and why decisions were made, you are doomed to repeat mistakes.

6. Improve the accessible reservoir of experience. For missiles, this means evaluating how well you predicted what would happen and then improving the model. For businesses, this means improving the collective memory of what works for each situation. Any reservoir of experience that does not improve becomes stagnant and outdated.

If you want a missile to perform as well as possible in an uncertain environment, you need to build it so that the six actions occur. If you want a business to perform as well as possible in an uncertain environment, you need to perform the same six actions. The key to achieving improvement is the model. As the model improves, the organization learns on two levels:

- By having a way to compare the goal with measurements and respond appropriately, the organization improves its execution.
- By improving its operating model (its understanding of work processes), the organization can improve its ability to plan. Intended or predicted results will become progressively closer to actual results.

Some people call this “double-loop learning.” This is a process of detection and correction of errors—not only errors in performance but also errors in the understanding of the process. Organizations that can do this generate new knowledge to maintain adaptability. They operate themselves as experimenting or self-designing organizations; that is, they maintain themselves in a state of frequent, nearly continuous change in structures, processes, domains, goals, and so on, even in the face of apparently optimal performance.

Appendix D:
How to Make Managing Knowledge a Normal Part of Everyday Work

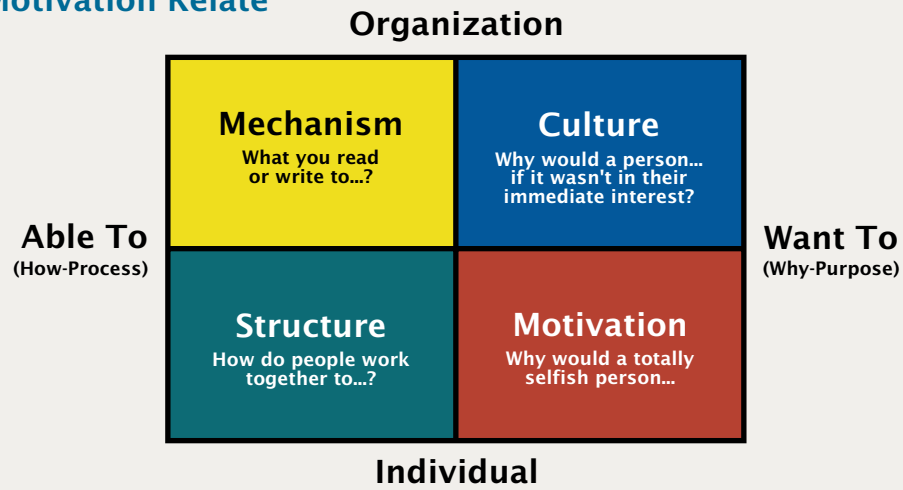
Design so that the organization and individuals both want to and are able to manage knowledge.

Building an Organization Can Manage Knowledge: The Matrix

What does it take to build an organization that has the six actions built in as a normal part of work? The problem seems complicated. Appendix C shows that if the six basic actions reliably happen, an organization will use its knowledge to perform as well as it possibly can. But what does it take to make those actions happen? To ensure that the six actions are followed, the organization, as a whole, and every individual within the organization, needs to be able to—and want to—capture, share, use, and improve the organization's collective experience base.

Figure D-1 shows a simple way to explain this. An organization is able to if it has a mechanism. An organization will want to if it has the right culture. Individuals in the organization will be able to contribute if they are part of the right structure and will want to if they have the right motivation. This matrix outlines four different dimensions of an effective knowledge management implementation. Miss one of these dimensions, and knowledge won't be managed.

Figure 5: How Mechanism-Culture-Structure and Motivation Relate



Mechanism: The Organization Needs to Be Able to Learn

An organization needs to be able to do the six actions. The right mechanism will give it this capability. Mechanisms are the tools or technology for learning; they help organize and document what is needed for the organization to learn. Individuals can use mechanisms to capture, share, use, and improve explicit knowledge. Examples of mechanisms are a lessons-learned database, a Web page with the latest price list, and a paper operations manual. A mechanism would answer the question "What would someone read or write?" to accomplish the six actions.

Without reliable mechanisms to accomplish each of the six actions, an organization's experience cannot be leveraged throughout the organization. For example, an

organization needs to “define goals linked to the bottom line.” A mechanism would answer the question “What would someone read or write to define goals linked to the bottom line?” A short answer to that question is “a goal-definition process.”

Similarly, an organization needs to “remember how and why decisions were made.” What would someone read or write to remember how and why decisions are made? One possibility is an auditable trail that documents the reasons for important decisions. Figure D-2 shows that each of the six actions has a certain mechanism to make an organization capable of capturing, sharing, using, and improving its experience. The matrix demonstrates that it is possible to define a key for each of the dimensions associated with one of the six actions. More information about each of these 24 keys can be found at www.built2learn.com. The book “Organizational Learning—The 24 Keys to High Performance,” which is available for order, explains each key in detail.

Mechanisms can reliably leverage experience. They should “Make my job easier”.

Motivation: Each Individual Must Want to Learn

Just because an organization has the capability to learn does not mean people within that organization will act. Individuals in an organization must want to do the six actions: They need the proper motivation. Motivation would answer the question “Why would a selfish person want to do the six actions?”

Failure to explicitly consider motivation is one important way that a number of knowledge management efforts fail, such as lessons-learned databases. They fail, not because they couldn’t work, but because people didn’t use them. If sufficient motivation—those things that would cause an individual to want to capture, share, use, and improve experience—does not exist, then it won’t happen.

Motivation can be both intrinsic and extrinsic. Intrinsic, or internal, motivation includes individual attitudes, beliefs, and practices. An example of intrinsic motivation is when someone helps another learn a task because it feels good. Extrinsic, or external, motivation includes organizational reward, recognition, and compensation systems. An example of extrinsic motivation is when someone receives payment or a promotion for sharing innovative ideas. Motivational systems can sometimes work against the concept of using knowledge. For example, reward and recognition systems that create an unhealthy competition between individuals in the same work group discourage the sharing of information between group members.

Without sufficient motivation to accomplish each of the six actions, organizations can’t benefit from experience because people will not actually use it. For example, an organization needs to “improve its accessible reservoir of experience,” but why would a selfish person want to do this? A selfish person would be motivated to do this if he believed that “his opinion is valued”; otherwise, he will think that it’s too much trouble to try to change things. Similarly, people need to “access a reservoir of experience,” but why would a selfish person want to do this? A selfish person would be motivated to do this if he thought it would “make his job easier.” Figure D-2 shows how each of the six actions needs a specific motivation that will make individuals want to capture, share, use, and improve collective experience.

Structure: Each Individual Must Be Able to Learn

An organization can have a mechanism and proper motivation, but that still is not enough. It needs to have a structure in place that allows individuals to capture, share, use, and improve experience. If it isn't someone's job to make it happen, it won't.

If improving knowledge isn't part of someone's real job it won't happen.

Figure D-2: The 24 Keys to Organizational Learning

Actions	Mechanism	Structure	Culture	Motivation
Define Bottom Line Goals	Effective Goal Definition Process	Stakeholders Involved	Shared Belief	Personal Commitment
Access a Reservoir of Experience	Accessible Reservoir of Experience	Shared Knowledge	Process Discipline	Makes my job easier
Direct Actions at Goals	Complete Set of Instructions	Defined Roles	Esprit de Corps	I like my job
Accurately Monitor Performance	Balanced Scorecard	Performance Monitoring	Integrity	I learn from past performance
Remember Decision Choices	Auditable Trail	Decision Making Process	Share with and Help Others	Learning is good for everyone
Improve Experience Reservoir	Post Analyze and Reset	Owners	Relentless Innovation	My opinion is valued

Structure is how people work together—roles, responsibilities, and processes. An effective structure helps to properly define goals, roles, and common processes. Structure can be formally represented in organizational charts, job titles and descriptions, and business-process flowcharts. You might have people trying to document and share what they know, but if your organizational structure blocks the flow of information between groups, your organization will not learn.

Structure answers the question "How do people work together to ensure that the six actions occur?" People can work together to "improve the accessible reservoir of experience" if they define owners as being responsible for the validity and timeliness of explicit knowledge and the application of tacit knowledge. All the extraction, transformation, timeliness, context, substantiated, and implied knowledge issues are interrelated through the concept of ownership. An organization that is not structured to have people fill the role of owner will not be able to improve its reservoir of experience. Figure 16 shows the other five components of a structure that would ensure that the six actions occurred.

Culture: The Organization, as a Whole, Must Want to Learn

Organizations with a mechanism, a structure, and motivation still need one more thing: They need a culture to glue individuals together. Culture is the shared beliefs, values, and assumptions that define the way that an organization or group captures, shares,

uses, and improves experience. Culture causes people to do something to benefit the organization even when it does not benefit them directly. A culture that supports the six actions is not just a “nice-to-have.” It is a must-have because cultural beliefs and assumptions can either support or hinder organizational learning.

For example, suppose an organization has a balanced score card that provides the mechanism for it to accurately monitor performance. What would cause an individual to want to accurately monitor performance if it wasn’t in his immediate interest? What culture would need to be in place? The answer, in a word, is “integrity.” Performance monitoring is useless if it isn’t accurate. If there isn’t a culture of integrity, numbers will be fudged and it will be impossible to find the root cause of any performance issue. If the culture is such that, when things go wrong, the first reaction is to assign guilt, then people will not work together to learn.