

KNOWLEDGE MANAGEMENT: UNDERSTANDING THEORY AND DEVELOPING STRATEGY

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"We now know that the source of wealth is something specifically human: knowledge. If we apply knowledge to tasks we already know how to do, we call it productivity. If we apply knowledge to tasks that are new and different, we call it innovation.. Only knowledge allows us to achieve those two goals."

--Peter F. Drucker

INTRODUCTION

Knowledge management has become the latest strategy in increasing organizational competitiveness. Proponents are calling it the only solution for competitive advantage in the new century (Evans, 1997; Hedlund, 1994; Hibbard, 1997; Martinez, 1998; Trussler, 1998) and critics are calling it the worst in passing fads (Hibbard, 1997). Robert H. Buckman, CEO of Buckman Labs, says the purpose of the knowledge management and sharing system at his corporation is to "facilitate communication across all of the organization's boundaries, so that the entire company works together to help everyone to be the best they can be" (Buckman, 1998, p. 11). Buckman Labs has become the first name in knowledge management with its innovative and relatively long-standing (since 1991) approach to harnessing employees' collective knowledge.

Fad or not, companies are taking steps toward better harnessing and utilizing corporate knowledge (Wilson & Asay, 1999). In the flurry toward knowledge management, new acronyms are surfacing as businesses have begun hiring CKOs (chief knowledge officers) and CLOs (chief learning officers) to oversee knowledge and learning in their companies (Earl & Scott, 1999; Hibbard & Carrillo, 1998; Martinez, 1998). A recent survey by Ernst & Young's Center for Business Innovation and Business Intelligence reports 94% of the respondents admit they could better use the knowledge in their companies through more effective management, 40% have knowledge management systems up and running or in development, and 25% have plans to develop knowledge management strategies in the next year (Hibbard, 1997, p. 2; Evans, 1997, p. 2). A survey by the Delphi Consulting Group in Boston reports even stronger results with 70% of the companies it surveyed saying they plan to make their first investments in knowledge management in the next 1 to 3 years (Hibbard & Carrillo, 1998).

The concept is rather simple: The collective knowledge of a company is almost unmeasurable and certainly priceless (Allee, 1997, p. 74). By tapping into databases, files, manuals, and most importantly, employees' brains to retrieve knowledge out of whatever receptacle in which it hides and putting it into the hands of those who could most benefit from it, companies have found they can save millions of dollars. Knowledge management can streamline inefficiencies and create millions in sales and product development (Hibbard, 1997; Watson, 1998). David Gurteen (1998) offers a comprehensive definition of knowledge management as "an emerging set of organizational design and operational

principles, processes, organizational structures, applications and technologies that helps knowledge workers dramatically leverage their creativity and ability to deliver business value.”

The “why” of knowledge management can be hard to pin down when results from sharing and managing knowledge are often intangible or difficult to track and measure. But a look at how organizations benefit from collective learning, combined with reports from companies successfully sharing knowledge, can help build a case for implementing knowledge management strategies. Questions emerge, such as, “How does a company manage not only all the knowledge it knows about—that which is stored in databases and files—but also all the knowledge it doesn’t know about—the knowledge inside employees’ heads?”

While the concept is basic, some companies have found the implementation of knowledge management elusive at best. Software companies are scrambling in the knowledge management movement to answer those questions, and IT departments are burgeoning with intranet development, electronic file management, and data warehousing duties (Hibbard & Carrillo, 1998) in an attempt to answer the “how” of knowledge sharing and managing. But the CKO will not have to double as CIO because the “how” will not ultimately come from the IT department. While the managing of files and data can be well handled by technology tools, accessing the knowledge inside employees’ heads is not a simple matter of an intranet or a database. As Buckman says, his system of knowledge sharing facilitates communication between organizational boundaries.

In this article, we examine the “why” and the “how” of knowledge management. We show that learning and

knowledge will be facilitated by a conducive corporate philosophy combined with effective communication, supported by technology.

ANSWERING THE “WHY”

The obvious answer to “why” is the pursuit of increased revenues and decreased costs. As surveys reveal, companies recognize that they are under-using the inherent knowledge found in their organizations and are thus ignoring the potential profit from leveraging that accumulated knowledge. (Evans, 1997; Hibbard, 1997). By leveraging this knowledge, businesses hope to achieve higher profits and lower expenses. However, leveraging is not without a price tag. Buckman Labs spends about \$7,500 per employee each year on knowledge management practices in an organization of more than 1,200 employees, totaling an estimated 3.5 to 4.5% of revenues (Buckman, 1998). Fulcrum Technologies, a developer of knowledge management tools, estimates per-user fees of its products to range from \$50 to \$400 (Watson, 1998). With price tags like these, the argument for developing knowledge management strategies needs to be solid and well supported.

ORGANIZATIONAL LEARNING

The theoretical side of the argument is founded on the notion that organizations learn (Hedlund, 73). Organizational learning is that which “at its most basic level . . . is the development of new knowledge or insights that has the potential to influence behavior” (Slater & Narver, 1995). The assumption is that this learning

“facilitates behavior change that leads to improved performance” (Slater & Narver, 1995; Argyris, 1992).

While organizational knowledge can take several forms, knowledge is generally referred to as either explicit or tacit (Buckman, 1998; Hedlund, 1994; Hibbard, 1997; Nonaka & Konno, 1998). Explicit knowledge is that which is already documented: located in files, manuals, databases, etc. You can manage this type of knowledge in the same way you manage information (Gurteen, 1998). Tacit knowledge, called by some “the greatest knowledge base in any company,” is that which is tucked away in employees’ heads (Buckman, 1998, p.12). By accessing, sharing, and implementing both explicit and tacit knowledge, organizations can influence behavior and achieve improved performance both individually and organizationally, and “the more effective organizations are at learning, the more likely they will be at being innovative” (Argyris, 1992).

Organizational learning takes place on two levels: adaptive and generative. Adaptive learning is the most basic level in which learning occurs within a given set of constraints; i.e., learners within organizations adapt to standard office processes and procedures (Slater & Narver, 1995). This has also been called “learning by doing” (Levitt & March, 1988). Generative learning, on the other hand, is a more pro-active and deeper level of learning in which organizations question long-held assumptions about practices and strategies, creating additional knowledge and new perspectives (Slater & Narver, 1995; Argyris, 1992). Organizations rarely build generative learning strategies into their knowledge management programs. However, there are many benefits to facilitating this type of learning. Rather

than solely relying on standard practice and theory, businesses should encourage employee inquiry and interaction, helping foster the generation of information and the sharing of knowledge throughout the organization.

Slater and Narver (1995) suggest that “generative learning is frame-breaking and more likely to lead to competitive advantage than adaptive learning.” The organization that encourages generative learning through knowledge sharing and management practices will yield both desired and unexpected benefits (Hedlund, 1994; Gogan, 1998), because even the most detailed and well-developed knowledge managing plan cannot anticipate the knowledge that will be shared when inquiring workers tap into each others’ tacit know-how. The following case examples demonstrate both tacit and explicit knowledge sharing.

BOTTOM-LINE RESULTS

At Dow Chemical, knowledge management efforts began in the patents office, where 30,000 patents—explicit corporate knowledge—had stacked up without an efficient method of cataloging or filing them. It made aggressive licensing of their technology very difficult, causing the company to lose millions in potential royalties. The company estimated that the \$25 million brought in through royalties could be quadrupled with better knowledge management techniques. As the company further explored its intellectual property, it realized that it could increase revenues by better managing not only patents, but trademarks and employee know-how as well (Mullin, 1996).

Because organizing the patents office as well as developing further

knowledge managing strategies promised to be costly, knowledge managers had to demonstrate short-term returns in addition to promised long-term results to help convince decision-makers of the value of knowledge management at Dow. Those short-term gains have come through initial savings. In addition to the increased royalties from better managing its intellectual property, Dow expects to cut "\$40 million over the next ten years in tax maintenance by eliminating unimportant patents from the portfolio" (Mullin, 1996). Those numbers were convincing enough to get the process underway, and the company has begun the knowledge management process by sorting through and prioritizing patents to determine which to eliminate.

At Buckman Labs, much of the convincing came from the top down. Robert Buckman has long been the champion of knowledge sharing in his corporation and boasts a long list of positive results from his company's efforts, which includes on-line training courses and access by front-line sales forces to back-stage product experts. He says knowledge sharing efforts in his company have "reduced the response time to the customer from days and weeks to a couple of hours or, at most, a couple of days . . . achieved faster progress of the talented people in the company, increasing morale . . . eliminated the roles of gatekeepers of information . . . and significantly increased the percentage of our sales from products that are less than five years old-from 14 percent in 1987 to 34.6 percent in 1996" (Buckman, 1998). Despite the \$7,500 per employee per year price tag, knowledge sharing tactics at Buckman Labs have proven effective in achieving increased revenues and decreased costs.

Hewlett-Packard (HP) estimates its annual savings from its Electronic Sales Partner program to be \$25 million. The

program is designed to give salespeople quicker and easier access to documents and literature that will help solve customer business problems. Printed information was haphazardly distributed and difficult to access, so the company compiled printed materials into a repository of over 25,000 sales documents and made it accessible through a Netscape browser on the corporate intranet (Davenport & Hansen, 1998; Watson, 1998). HP was able to calculate savings based on the assumption that the document retrieval system saved salespeople two to five hours a week, giving them that much more time to sell.

Lasting positive results are not achieved spontaneously, however, and organizations do not experience adaptive or generative learning without specific planning and focused execution. Because software companies and IT tool developers have jumped on the knowledge management bandwagon, many businesses are mistakenly leaving knowledge management with IT departments, charging them with developing intranets and file sharing. However, the most effective planning and execution will take place outside technology; technology will serve to support the sharing of knowledge. The "how" will ultimately be answered by managers and corporate communicators committed to developing a learning organization.

ANSWERING THE "HOW"

While knowledge management is sound and can yield positive results for the company that successfully implements it, the strategy behind the management must build on the practical rather than the abstract. Some zealots would have companies seek out and harness *all* explicit and tacit knowledge they can identify. But

such a far-reaching goal is both impractical and overwhelming to most companies and fuels arguments for critics who claim that the return on efforts to harness knowledge is far less than the investment in the process. However, a pragmatic admission that not all knowledge is created equal (Mullin, 1996) will help focus and shape knowledge management strategies into useful and result-yielding practices.

Underlying this practicality is the recognition that knowledge management is a business practice, not a technology (Angus, Patel, & Hardy, 1998; Hibbard & Carrillo, 1998). Experts remind companies that “no technology can single-handedly deliver knowledge management. ‘What’s important is not just a set of technologies, but a concept that’s deployed in an organization” (Hibbard & Carrillo, 1998); “Technology on its own cannot make knowledge management happen” (Hibbard, 1997). Business managers are discovering that “it’s more about changing business processes than about upgrading software” (Hibbard & Carrillo, 1998). While there is no “silver bullet” to managing and sharing knowledge (Allee, 1997), the most effective strategies include filtering knowledge, strengthening corporate philosophy, and facilitating effective communication.

FILTERING KNOWLEDGE

While companies “benefit from leveraging existing information, industry experts warn against going after existing assets without knowing whether they will pay off” (Hibbard & Carrillo, 1998). Because not all knowledge is created equal, experts also suggest to “resist the temptation to categorize and catalog information just because you have it captured” (Hibbard & Carrillo, 1998). A

company can quickly become overwhelmed by all its explicit know-how (Mullin, 1996). Instead, managers should ask themselves, “What’s the potential value of that information?” (Hibbard & Carrillo, 1998). A well-trained staff of knowledge managers consisting of interdepartmental members must be savvy enough to recognize value-adding knowledge and to determine the explicit knowledge that is shared (Mullin, 1996). On the contrary, a staff lacking vision can overlook key information or underevaluate information, inhibiting an organization’s learning and knowledge management success (Gogan, 1998).

Determining valuable knowledge can be done by setting up cross-divisional review teams to decide what to make available from various departments (Mullin, 1996). The sharing and managing of that knowledge can be supported by implementing specific technologies such as an intranet, data warehouses, or collaborative filtering (Hibbard & Carrillo, 1998). A combination of human and technological resources will help a company determine what explicit knowledge to manage and how to manage it. When managers at Dow recognized the vast repository of value-adding knowledge lurking in the patent archive, it named a vice president over licensing to oversee the project and created a database of patent records that assigned almost 100 points of data to each patent (Mullin, 1996). With that effort, the company is beginning an aggressive licensing campaign to gain the value this explicit knowledge adds.

However, the effective and successful sharing of the more elusive tacit knowledge will not usually come from a knowledge management team dictating what knowledge to share nor from well-constructed databases, but rather from cultivating a corporate culture that

encourages sharing among employees and by facilitating communication throughout the organization.

CORPORATE CULTURE

The fundamental aspect of helping employees share their knowledge lies on the broadest corporate level. Research conducted by Delphi indicates that cultural issues are the largest obstacles to implementing successful knowledge management strategies (Hibbard & Carrillo, 1998). McDermott (1999) states that the "difficulty in most knowledge management effort lies in changing organizational culture and people's work habits." Similarly, Angus et al. (1998) found that "knowledge management implementation requires a shift in philosophy for most organizations-not only in how people work, but more importantly in how they behave and interact with each other" (Angus, Patel, & Hardy, 1998). Without an environment that encourages sharing, both by expectations and incentives, knowledge sharing and management practices within a corporation are destined to become the fad critics claim they are.

A case study of a baby food manufacturer revealed that in-built competition within the corporate structure inhibited knowledge sharing practices that could have significantly increased revenues. The performance of front-line salespeople was evaluated based on that of other salespeople. Because of this, a group of sales people found a market niche in selling baby food to aging adults who could no longer eat hard food, but they kept knowledge of their customer base to themselves and let only their successful sales indicate their find. Because the

company's culture bred competition between employees and offered incentives based on a curve, it missed out not only on increased revenues from additional sales in that market, but also on potential product development to better fill this niche (Siehl, 1989).

Effective knowledge sharing and management happens in an environment "that respects individuals and encourages individual creativity" (Mullin, 1996). In such an environment, "anyone who might have critical knowledge to help design contents, form, and delivery mechanisms" (Kowalkowski & Angus, 1998) is not only allowed to contribute but asked to do so. Some experts suggest making "knowledge transfer a prominent criterion in the evaluation and compensation system, with high profile rewards and recognition for significant contributions" (Trussler, 1998; see also Mullin, 1996). Buckman Labs makes knowledge sharing a top criterion in employee promotion (Buckman, 1998), providing individual incentive to promote organizational growth. Verifone Corporation, maker of payment card systems, has an explicit top-down expectation in their knowledge sharing practices that employees regularly use e-mail and immediately respond to queries (Trussler, 1998).

Because downsizing has propagated the "belief in the disposability of employees," many workers have lost trust and loyalty for their employers. Therefore employers have to cultivate relationships of trust so employees do not feel that the sharing of their knowledge equals the giving up of their competitive edge (Angus, Patel, & Harty, 1998), as was the case with the baby food manufacturer. Buckman insists the ultimate goal is to "create a climate that fosters long-lived, trusting relationships. ... [a] climate of continuity

and trust that fosters proactive knowledge sharing within the company” (Buckman, 1998). The bottom line: “Workers must be reassured that they will still be valued after they give up their know-how” (Hibbard & Carrillo, 1998), and it is up to managers to help create a culture that encourages trust within the corporation and sharing among the employees.

FACILITATING COMMUNICATION

If the purpose of knowledge management and sharing is to “facilitate communication across all of the organization’s boundaries, so that the entire company works together to help everyone to be the best they can be” (Buckman, 1998), then knowledge managers need to look at specific tools and tactics that will enable information sharing between employees. By facilitating all types of communication, organizations can put less focus on their knowledge stock and more emphasis on the more important element of knowledge flow (Fahey & Prusak, 1998).

To generate learning, managers need to look beyond technological devices and tools that handle historical knowledge and develop systems based on fundamental aspects of communication. Horton (1995) says, “Corporate communications are tools used by managerial craftspeople such as carpenters use saws, planes, and hammers. Managers should know which tools to use and how to use them to achieve productive and profitable results. Careful integration of tools will help you build a house faster than a random choice. Similarly, careful integration of corporate communications will build an organization better than haphazard messages and media.”

Those tools are found in basic communication theory. The *sender*

originates and transmits the message, the *message* is that which is being sent, the *channel* is the means by which the message is sent, and the *receiver* is the destination of the message (Infante, Rancer, & Womack, 1997). Understanding these terms and the relationship between them will help knowledge managers develop more effective knowledge sharing techniques, specifically better ways to share tacit knowledge. A scenario could look like that at Hewlett-Packard: the sender is the front-line salesperson who has a question about a certain product. The message is the question, the receiver is a product developer or an engineer, and the channel is a corporate-run listserv. When the product developer responds to the query, roles reverse and the receiver becomes the sender and the sender the receiver. The message becomes an answer instead of a question. This process of inquiry and response creates the generative learning of individuals and organizations.

According to Hedlund (1994), “Any good knowledge management system must elicit knowledge from many nodes, often distant from each other.” For senders to elicit knowledge from receivers, they must be given access to each other. That access comes in several ways, most of which point directly back to corporate culture. Senders and receivers must exist laterally within the corporation, not only vertically, and they must feel part of a whole rather than part of a part (Hedlund, 1994). At Buckman Labs, “Anybody anywhere in the world can contribute to the solution of a problem in the company no matter where it occurs” (Buckman, 1998). The theory behind this is that “only by increasing all individuals’ spans of communication as well as their spans of influence, and by turning individuals loose in the company to be efficient . . . can our organizations be the

best they can be.” By giving employees access to each other, rather than going through vertical channels of upper management, those with the most current information can share it with those who will benefit most from it. When companies increase the “flow of information from development to manufacturing to sales and marketing, they improve the organization’s ability to make rapid decisions and execute them effectively” (Slater & Narver, 1995).

To give employees access to each other and to facilitate this flow of information, knowledge managers can also create tangible channels through which senders and receivers reach each other. In large corporations, simply encouraging employees to visit one another’s cubicles may be a step but will fall drastically short of supplying the necessary channels for senders and receivers to transfer messages. Companies, particularly larger, decentralized ones, need to physically provide channels, in many cases technological channels, through which knowledge can be shared, because “the [technology is] what facilitate[s] the practice of knowledge management-or at least specific aspects of it” (Angus, Patel, & Hardy, 1998).

In this aspect of knowledge sharing, the IT department will play a key supporting role. Channels are e-mail listservs, newsgroups, electronic bulletin boards, as well as intranets with chat rooms, department pages, and experts lists with contact information (Hibbard & Carillo, 1998), all of which link senders and receivers across geographical as well as departmental boundaries. An example at Buckman Labs demonstrates the value of creating channels for senders and receivers to access each other. An associate in Indonesia was working on a proposal with a client and needed additional explanation of information he’d found on the corporate

intranet, K’Netix. Through a web-based communication network, the associate was able to ask for help on clarifying a highly technical aspect of the proposal. The answer came and an extremely detailed persuasive proposal was in the client’s hands within days. Without the intranet and communication network, this associate would have had to fax requests to contacts at various offices, hoping his query would reach the appropriate people. Instead, the process was reduced from several weeks to a few days, helping to land the company an additional \$6 million worth of business (Martinez, 1998). In other examples at Buckman Labs, an employee’s knowledge of beer and wine fermentation helped the paper and pulp division find viable solutions to a project under development, and an employee’s past experience in the paint industry helped the water treatment plant answer a customer’s question about paints (Martinez, 1998).

Unlike explicit knowledge which can, theoretically, be organized and managed by staff members, tacit knowledge like that shared at Buckman Labs does not lend itself to being quantified and catalogued. Knowledge management staff have no way of adequately discovering all the knowledge tucked away in employees’ heads and even less chance of foreseeing when what knowledge would be useful. Companies should “resist the urge to create a top-down definition for the kinds of knowledge to manage and the forms it should take” (Kowalkowski & Angus, 1998). But by creating channels of communication and an environment in which knowledge can be and will be shared, senders and receivers will determine the message, and demand will determine the supply. From that natural process will come benefits that even the most savvy knowledge managers could not have calculated: “In the process of tapping

the world for knowledge, bits are sometimes picked up and used in ways and contexts quite surprising to the 'exporters,' since the purchase of the part does not necessarily imply buying in to the tacitly assumed totality" (Hedlund, 1994).

By providing a way for, and motivation for, employees to tap each others' knowledge, corporations will continue to generate learning and give "the organization the capacity to be more effective every passing day with the gathering of institutional memory the way human beings have the capacity to become more effective and mature every day with the accumulation of thoughts and memories" (Angus, Patel, & Hardy, 1998).

CONCLUSION

With a careful examination of the "why" and a practical approach to the "how", organizations can create with knowledge sharing and management a competitive edge rather than a passing fad. However, without an environment that encourages and facilitates the sharing of knowledge, talents, and skills, the anticipated benefits defined in the "why" stages will remain fleeting goals. But with that environment and an understanding of the players in the communication process, organizations will continue to learn, corporations will continue to expand, and knowledge will take businesses into the 21st century, because "our thirst for knowledge has led us from the industrial age to the knowledge era and will take us beyond" (Allee, 1997).

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