Knowledge Management and Training

The Value of Collaboration

by Larry W. Carlile, PhD

Whether working in the field of training and development (T&D) or knowledge management (KM), most of us have a goal in common: to help our company's employees obtain the knowledge needed to do their work. Despite many obstacles, we are frequently quite successful. However, in many companies we could achieve much greater success if KM and T&D worked together more closely.

Although KM and T&D organizations have the same goal, each tends to miss or underutilize key assets of the other. KM focuses on providing valuable information, but it often lacks a focus on learning or turning this information into knowledge. T&D organizations do focus on learning but frequently lack the original sources of intellectual capital available to KM organizations. The respective processes the two types of organizations use to identify and capture information that is valuable to others are usually quite different and seldom linked (or even coordinated) with one another. A common paradigm for T&D is for a team to be assembled that includes instructional designers and subject matter experts (SMEs) to create training. The result is an intervention designed so that participants will learn, thereby gaining knowledge.

What Is Knowledge?

A complexity in defining knowledge is that it is common to use the term *knowledge* metaphorically to apply to organizations. This article will limit discussion of knowledge to humans.

In a sense, we all know what knowledge is. Nevertheless, there are many views and ways of expressing it. Many now choose to differentiate tacit or uncodified knowledge, that which exists in our brains, from explicit or codified knowledge, that which exists in books, databases, etc. However, calling the latter knowledge is questionable. At the least, it can be confusing.

Clancey (2001) points out, "We must not confuse representations of knowledge with whatever neural structures are in the brain coordinating our activity" (p. 5). Godbout (2001) writes, "Information becomes individual knowledge when it is accepted and retained by an individual as being a proper understanding of what is true…." (p. 3). From this perspective, knowledge does not reside in verbal or pictorial representations.

According to the definitions put forth by Lecoeuche, Catinaud, & Greboval-Barry (2001), knowledge is differentiated from fact in that knowledge is "…information that can be used in a decision process" (p. 2). Godbout discusses the relationship between the terms data, information, and knowledge. Data "…consist of recordings of transactions or events…. As such, data do not carry meaning unless understood in the context in which it was gathered…. Information like data, is carried through symbols…" (Godbout, 2001, p. 1).

Zack (1999) says, "Knowledge is commonly distinguished from data and information. Data represent observations or facts out of context that are, therefore, not directly meaningful. Information results from placing data within some meaningful context…." (p. 46). Harney (2001) notes that even "search engines find information…" and that "the primary difference between information and knowledge is relevance, a personal applicability…" (p. 1).

Two themes emerge in these views. First, although data, information, and knowledge are related, they have a hierarchical relationship. An even more important theme is that internalization distinguishes knowledge from information. Internalization takes place only when an individual participates in learning. Knowledge is not obtained by the mere presentation of data or information; that is not sufficient. And *representations* of someone's knowledge, visual or textual, are not knowledge.

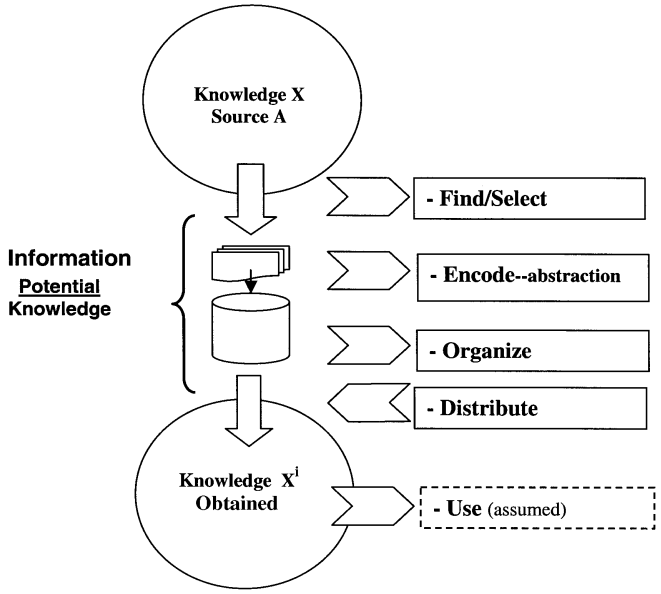
What Is Knowledge Management?

There also are many views of what knowledge management is. Some would define it technologically, others more functionally. Some define knowledge management by what it is not. For example, some say it is not simply things such as data mining, document management, search engines, or communities. Others say it is one or more of these plus other elements. Among the various views, the following authors define it well.

According to Knowledge Management.net (2001), "Knowledge management is the systematic process of finding, selecting, organizing, distilling, and presenting information in a way that improves an employee's comprehension in a specific area of interest.… [It] helps an organization gain insight and understanding from its own experience" (p. 1).

Drawing from other authors, Marshall and Rossett (2000) write, "KM involves recognizing, documenting, and distributing the explicit and tacit knowledge resident in an organization's workforce. The mission is to provide the right information to the right people at the right time" (p. 23).

The idea behind KM as a process of capturing, organizing, and distributing intellectual capital is for others in that organization also to know it. However, when such intellectual



Figures 1. Typical Components of Knowledge Management.

capital is distributed, typically, it is only information that is some representation of the knowledge some individual has or had. Regardless of the level of representation, it is still only information until someone else learns it.

This distinction should not be trivialized as a simple matter of semantics. In fact, it may be the way the terms information and knowledge are confused in usage that is responsible for a lack of focus on learning in KM processes and models.

Figure 1 is a model that contains commonly occurring elements of a KM process. In this model, the assumption is that the information (potential knowledge) will be used somehow.

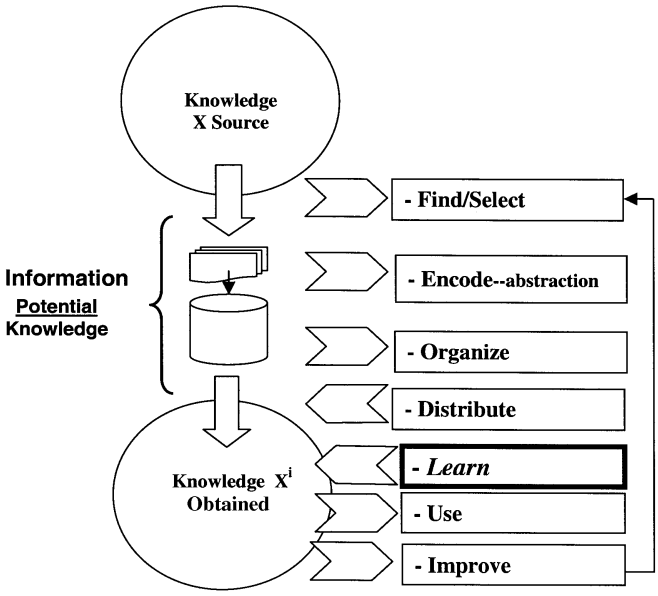
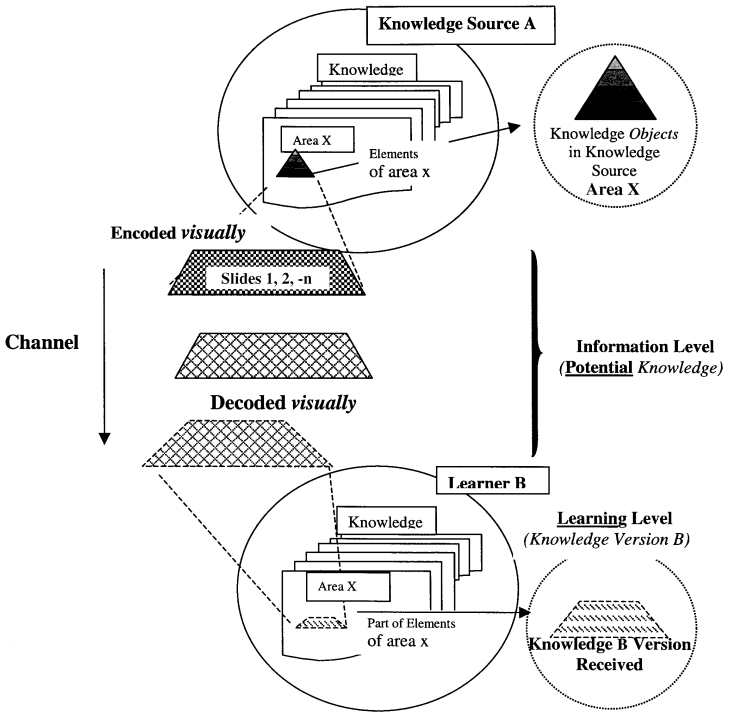


Figure 2. Enhanced Model of Knowledge Management.



Figures 3. Illustration of Visual Representation of Knowledge.

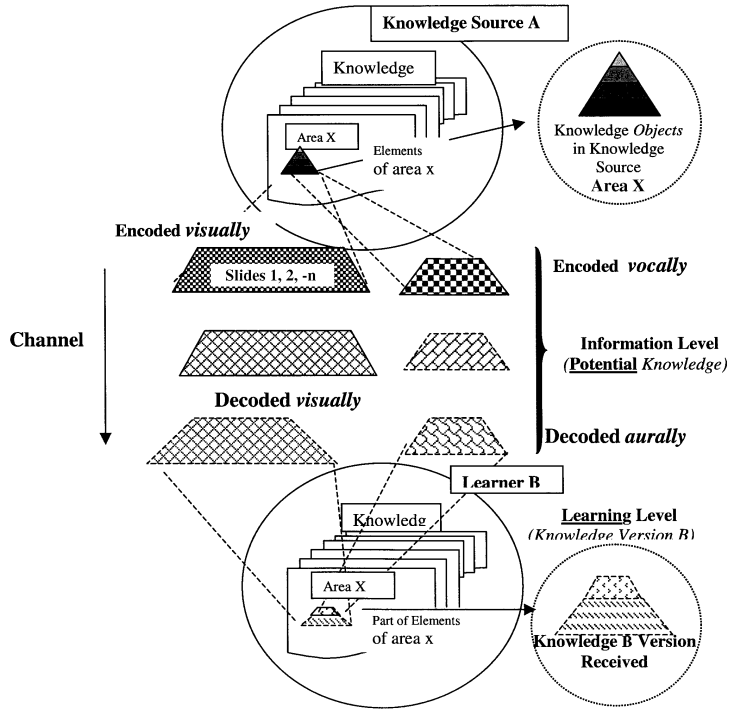


Figure 4. Illustration of Visual and Vocal Representation of Knowledge.

How can it be used until it is learned? As O'Dell and Grayson (1998) put it, "…[J]ust knowing that the practices or knowledge exists is not enough to ensure transfer or use" (p. 7).

Thus, an effective KM process must also have a focus on learning. Without a focus on learning, knowledge management is really only information management or management of potential knowledge. In order to be true knowledge management, the learning segment of the process must take place.

This is illustrated by the model in Figure 2 that does include learning, the necessary element before use. At the point when learning takes place, an individual has new knowledge. However, that knowledge is still only an approximation of the knowledge possessed by the original source.

As an illustration, Figure 3 shows that knowledge is not transferred in any sense such as being bundled up, transported, and installed. In this diagram, the knowledge source has several kinds of knowledge, represented as several planes. First, it is evident that only certain aspects of the original knowledge are encoded as the representation of the original knowledge.

Here, some knowledge about *area x* is depicted as a complex pyramid. A certain portion of the knowledge that Knowledge Source A has is encoded into a visual representation, such as a PowerPoint® slide. Some degree of degradation is introduced through every step of encoding, transmitting, and decoding (this is illustrated by the decreasing accuracy or completeness of the content in the pattern). The slide is then seen by the Learner B, but what is actually learned and becomes knowledge for the receiver is yet another matter. Thus, even less-complete or accurate content is shown in the last view of the pyramid.

Figure 4 illustrates that by adding another channel (auditory), a more complete representation of the original knowledge is possible. Here, another aspect of the original knowledge is encoded vocally as the source explains the representation on the slide. Still, no matter how good the representation, it is only a representation.

Again, the most important determinants of the actual received knowledge are the receiver's context, such factors as culture and experience used in interpreting the representation. What can be done to optimize reception of the valuable original knowledge? Are there contributions from training, and more specifically e-learning, that would be helpful?

E-Learning and Knowledge Management

Although KM is practiced in many ways, it usually relies heavily on electronic methods. Thus, one might wonder whether e-KM differs from e-learning and, if it does, how.

Rosenberg (2001) puts forth the view of e-learning as being comprised of both training and KM. "So when we have a learning need that requires instruction, we can use training, and when there is a learning need that more appropriately requires information, we can use KM" (p. 11).

From Rosenberg's perspective, training provides knowledge and skill, while KM only provides information. In that case, why isn't KM merely called information management? One reason might be that the term *information management* is already used more broadly. Beyond that, it might be called KM because, to most who use the term, it is not intended to be about information; it is intended to be about knowledge.

The term e-learning should be viewed as including both training and KM; however, KM also should be focused on providing knowledge. Of course, as it is often practiced, a number of things could be done to improve how well KM provides knowledge. We contend that bringing learning principles to KM can be a major contributor to improving KM as one of the elements of e-learning.

Even Rosenberg (2001), when discussing the use of KM, alludes to two factors that could promote converting information to knowledge. "We can simply reference the information and have confidence that [users] can learn it—if they know how to learn, and if we've provided the information in ways that make sense to them" (p. 109). The first phrase implies that the individual is totally responsible for having sufficient motivation and enough persistence to overcome KM's lack of a focus on designing information for learning. But the second phrase suggests that information designers have a responsibility to put it in a form that makes sense to individuals. Which is it? If, as Rosenberg suggests, KM is a part of e-learning, knowledge managers have a great responsibility to ensure learning.

How Can T&D Enhance KM?

T&D professionals are likely to have a background that is different than KM professionals' because of T&D's focus on learning. Consequently, they can play an important role in providing a context for acquiring and applying knowledge and developing skills that are critical to an organization's business. A few examples of how the knowledge and experience of T&D professionals can contribute to KM effectiveness follow.

Gathering Information (Content): Instructional designers can be helpful to KM professionals through their skill at working with SMEs. Designers are accustomed to working with SMEs from numerous disciplines. They use a variety of methods to extract information from SMEs and organize the information into logical, instructionally sound sequences, steps, or models to make it easier for others to grasp and apply. These skills could help KM incorporate more of the new content and provide it in a form that may be more responsive to the learning needs of users.

Defining Desired Outcomes: Another way instructional designers can help is by focusing on specific desirable performance outcomes. The discipline of instructional design traditionally requires the definition of an observable objective that can be attained and the creation of a learning strategy and design that advances the learner toward the objective. Applying this approach and focus could allow some KM systems to deliver additional benefits to their users. Collaboration between instructional designers and content experts can result in compelling, effective messages structured in ways that help learners achieve specific goals.

Matching Methods to Learning Outcomes: The design of instructional or learning methods is not the same for every kind of knowledge or skill to be acquired; it depends on the learning outcome desired. Learning for verbal knowledge can require different tactics than learning cognitive strategy. The former may require reinforcement and association, while application and feedback might be essential for acquiring the latter. Instructional designers know this and can apply the preferred strategy for the type of learning desired in each situation, an approach that could only add to KM's value.

Learning Sequencing: Another T&D framework that could be useful to KM is ordering activities to best support the learning process, in other words, deciding what needs to be done in what sequence (e.g., gaining attention, clarifying objectives, information presentation) for the greatest amount of learning to occur (Gagné, Briggs, & Wager, 1988). A different aspect of sequencing that is often important is the logical ordering of information or concepts for learning. Instructional designers commonly address this by building on previous knowledge that must exist before learners can understand what comes next. The same can be useful in KM.

Adult Learning: Still another area in which T&D professionals have applicable knowledge is how to be successful with adult learners. Fortunately, most T&D professionals have knowledge of adult learning principles and how to make use of them. This can be advantageous to KM, too, because KM's audience is most likely adults.

Learning Styles: Instructional designers also are cognizant of the importance of accommodating individuals' differing styles or preferences for learning input. This concept has great potential for application in KM. One size does not fit all when it comes to learning styles. Thus, KM could benefit from application of this concept.

Learning Innovation: KM and T&D can support learning and performance in ways that look different form traditional training. These professionals can, and in some organizations

do, collaborate in developing electronic performance support systems (EPSS). From the user's perspective, the important thing is to have the knowledge and skills necessary to be effective in a work situation. It is less important whether the knowledge or skill is gained at the time it is needed (as with EPSS) or is developed over time in preparation for the need (training). The goal is to have the ability to apply the knowledge or skill in work when needed.

In the past, T&D professionals may have focused too heavily on providing knowledge in structured programs before the point of need. Perhaps this was because they focused on efficiencies that could result for the T&D organization rather than on the individual needs of the target audience. However, this is changing, making the T&D community even more valuable as an ally to KM in meeting business needs. And T&D seems to be getting on board with the current focus on learning objects and learning content management systems.

Examples

Perhaps it would be useful to provide examples of possible contributions that can result from mutual efforts by T&D and KM professionals. Let's start by talking about what is typically captured from someone with valuable knowledge.

Typical Scenario: A part of many companies' KM system is an electronic document repository for storing and making available valuable proprietary information. In such companies, experts who develop a new approach are encouraged to submit documents to the system.

Commonly, information is captured in the form of PowerPoint® slides or some other electronic presentation medium. Other times, the information is in the form of an article or paper. The intent is that other individuals will search the repository to find information on a topic and that the information found will be relevant to them. In such cases, an individual would find only slides or a paper that represents something the source knows or knows how to do (see Figure 3).

One way to enhance the amount or accuracy of received knowledge is to augment the visual representations with voice explanation and examples (Figure 4). But for such an additional explanation to be available in a repository, that additional spoken information captured from the knowledge source must be made available along with the slides.

Currently, some companies are capturing such additional information using state-of-the-art web methods. Rather than merely capturing slides, explanations and examples are captured by recording what the knowledge source provides as supplementary spoken information. A number of tools are available for this purpose and can be found on the Internet.

Glossary

According to the E-learning Glossary compiled by Eva Kaplan-Leserson, **LCMS (learning content management system)** is a software application that allows trainers and training directors to manage both the administrative and content-related functions of training.

A **learning object** is "a reusable, media-independent chunk of information used as a modular building block for e-learning content." http://www.learningcircuits.org/glossary.html#LCMS

According to Brandon Hall's glossary, a **learning content management system** is an environment where developers can create, store, reuse, manage and deliver learning content from a central object repository, usually a database….

Learning objects refer to "self-contained chunks of training content that can be assembled with other learning objects to create courses and curricula, much the same way a child's Lego blocks are assembled to create all types of structures." http://www.brandonhall.com/public/glossary/index.htm

(Sources: Kaplan-Leserson 2002; Hall, 2002)

Further enhancements can result when an instructional designer works with the source SME before and during the capture process to help mold the slides and spoken information. Even more enhancements can be added by instructional designers later. Thus, the need for more of the SME's valuable time can be avoided.

Since SMEs often are not thinking in terms of learning or specific learning objectives when creating representations, instructional designers can make a valuable contribution by helping to focus on these objectives, particularly those for differing audiences. For example, one audience might need to have the knowledge of a new product or method to sell it, while another audience might need to know how to create the product.

Put Into Practice: In one company, instructional designers helped knowledge sources attend to several other elements of learning that were usually overlooked in KM applications. Before attempting to capture additional information by voice recordings, experts and designers began a dialog on learning and what they wanted to achieve. Because these experts usually captured information in large chunks and with very broad objectives, focus first went to the learner and what the learning objectives should be. That led to consideration of different audiences of learners and what the objective should be for each. With the information segmented into groupings that made sense for the learning objectives, attention could be placed on other learning enhancements.

Further development of knowledge learning was done using one of several web-based learning applications. Although

What's the Difference?

When are e-learning modules training, KM, or EPSS? One view is that it depends on how they are designed and how they are used by learners. For example, if an e-learning module is designed to be completed by all employees, or if a manager requires that individuals on a team complete a particular e-learning module to qualify for a particular position, most would say that it's training.

However, if an individual, on his or her own, finds and accesses an e-learning module that resides in a knowledge repository just to learn about it, many would say that is an example of KM. On the other hand, if an individual accesses an e-learning module or it is automatically presented so a person can learn how to carry out a job, it could be EPSS, depending on how well it has been designed to be useful for that purpose.

each had its advantages and disadvantages, all permitted the designers to create special ways of reinforcing learning and retention. The simple information was enriched with exercises, reviews, animations, and other visual effects to achieve the objectives.

In addition, individual differences in learning preferences were addressed by providing options for navigation that permitted individual learners to have more control, thus enabling them to better meet their learning preferences. Functions were added that allowed the learner to pause, review, or branch. And since some learners prefer navigation from a text view while others prefer a graphic view, both alternatives were added to help accommodate differences in visual preferences.

The result of working with the experts in a knowledge content area was a group of web-based modules that represented a *curriculum* for each audience in a repository (KM). Access could be granted to either a broad audience or just to those with the greatest need to know. Learners who accessed these modules had a vastly improved learning experience than those merely seeing slides or reading articles.

Another company had a KM system that encompassed its marketing and technical information. T&D professionals were instrumental in creating a learning path through these information resources. They divided information into courses that established clear learning objectives, advised learners which KM resources to access and review and in what order, and provided supporting instructions and application exercises. The learning path also included a pretest and post-test for each course. The result was a certification system that is highly valued and has been in place for many years. Furthermore, by leveraging the assets of both T&D and KM, this system was developed at a fraction of the time and cost of starting from scratch.

How Can KM Enhance T&D?

Of course, the benefits of collaboration go both ways. Without doubt, there are many ways that KM can enhance efforts of T&D organizations. A few include content resources, motivation, supporting information, and rapid accessibility.

Content Resources: KM could provide T&D with access to additional information and resources to support training programs and their development. Often, KM processes create greater pull to capture new knowledge than do T&D organizations.

Motivation: Users often access KM when they have an immediate need to apply new knowledge or skills. Designers of web-based training, on the other hand, often face the challenge of whether people are sufficiently motivated to complete learning modules on their own. Providing links to pertinent e-learning courses in KM systems might allow T&D to reach people when they are most highly motivated to learn.

Supporting Information: Because the amount of time people can spend in a learning program or course is always limited, T&D cannot teach all the details people may need. KM and KM systems offer an important solution for providing learners with access to the volume of specific information they may need that cannot be covered otherwise.

Rapid Accessibility: With the rapid pace at which information is changing and new products are being introduced, T&D cannot always respond quickly enough. KM allows new information to be accessed faster and to be accessible to users while training is being developed.

Making It Happen

KM and T&D are two interrelated areas that together can support learning and performance in ways that differ from traditional training. Leaders of KM and T&D organizations will benefit when they begin to acknowledge the value of mutual efforts. The continuing growth of e-learning and EPSS makes it more evident that there is a natural fit between KM and T&D.

However, it is unfortunate that organizational structure and politics, among other factors, do not always make it easy for KM and T&D professionals to work together. Sometimes turf protection can overrule cooperation. Sometimes differing philosophical, theoretical, and practical mindsets can prevent cooperation. But grassroots efforts can knit together two areas of turf and philosophy if handled appropriately. For example, by establishing relationships with individuals in knowledge content areas, individuals in T&D can offer to

collaborate on learning projects with KM. Until organizations are given formal incentives to work more closely together, apparently, it is up to us as individuals to make it happen. And we will, as we continue to work toward our professional goal of helping people work more effectively day to day.

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