

Humanistic Knowledge Technology

by William Seidman

What do portals, search engines, personnel profilers, and document management systems have in common?

There are at least four answers to this question:

- Together, they are what most people think of as knowledge management technologies.
- Each one is more about technology than knowledge.
- Each one has little awareness of, or concern for, how and why people share and use knowledge.
- None of them has been truly successful at helping organizations become significantly more productive in the use of their existing knowledge.

Why haven't these systems been more successful? Primarily because knowledge is first and foremost a human activity, and these technologies are not about people. A single person develops knowledge and makes a decision to share it. Another person makes a decision to utilize the knowledge. Knowledge management can only be effective if it starts with the humans involved. All of these technologies begin with an overwhelming focus on technology and have little regard for human motivation or cognitive processing.

In sharp contrast, there is an emerging technology that makes the human being absolutely central by emulating the human "coaching" experience. For the purposes of this article, we will call it "digital coach technology" (DCT). One user describes DCT as "a superb blend of human cognition, organizational development, and technology." As such, DCT is beginning to have a considerable impact on productivity and revenue, reducing planning time 80%, training time 50%, and performance time 30%. In addition, many training, consulting, and professional services organizations use DCT as an extension of their services, generating substantial additional revenue.

DIGITAL COACHING

Digital coaching typically uses a highly structured process (see Figure 1) consisting of a specialized interview that prompts the expert to tell the story of his or her knowledge (called the "naïve new person

story"), polish the story into a repeatable best practice, and store the best practice in an archive. When an inexperienced person needs to perform the function, he or she recalls the best practice from the archive and is "coached" through performing the function as though the human expert was sitting alongside, only it is done through the technology. DCT creates the mentoring experience at the cost of replicating software. When using well-designed DCT, users stop distinguishing between the digital coach and the human coach by the second screen. Once you have this robust design, almost any content can be plugged in, and the overall process works.

DISCOVERING DIGITAL COACH TECHNOLOGY

DCT was largely discovered by accident. The team that discovered DCT originally set out to create software that "coached" project decisionmaking. This was not

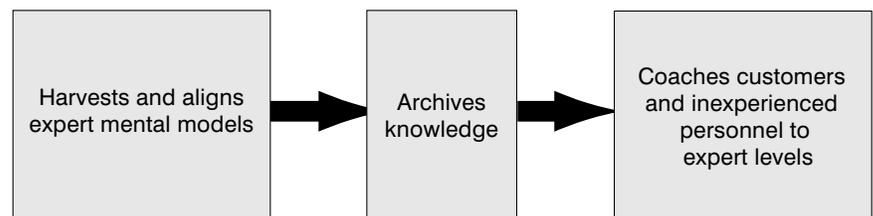


Figure 1 — DCT structure.

project scheduling. Instead, it was the process of guiding teams to align on goals, objectives, decision-making processes, and other key “soft” elements of project management. Introduced in July 1998, the product was quite successful in guiding project teams to better thinking. However, the software also began to be used by many nonproject functions, such as marketing, credit card operations, major account sales, and mergers and acquisitions.

In August 1999, the team analyzed the diverse uses of the software and realized that it had stumbled on some universals of both coaching and expert cognition. The software would pose a question or open a field that was in fact a universal prompt for a certain type of information. For example, one set of fields queried users about what they were doing in such a way that the users would always frame their answers from their personal perceptual framework. If they were designing a microprocessor, it would be a statement about their design. If they were trying to buy a company, the response would be about the acquisition process. From this and other information, the team learned that the experts were using an identical cognitive framework regardless of their area of discipline, and that the software could be honed to leverage expert cognition.

While these findings were interesting, it was another event that spurred the team to push further into the area of integrating humanism with technology.

One of the most common complaints about knowledge management systems is that experts consistently refuse to share their knowledge.

The team learned that a company using the original coaching software wanted to sell the knowledge it had put into the software to its end-user customers and that the company expected to make \$50 million annually from the sale of its digitized knowledge. For this one company, the knowledge contained within the system was actually more valuable than the technology itself.

The obvious economic implications promoted the team to concentrate on how the software was causing people to share knowledge, how people were reusing their own knowledge, and why some people thought the knowledge could be sold in that format. In particular, the team discovered the power of using stories to harvest knowledge and the importance of “passion” both in the harvesting of knowledge and people’s willingness to utilize others’ knowledge.

HUMANISM AND HARVESTING KNOWLEDGE

One of the most common complaints about the numerous so-called knowledge management systems is that experts consistently refuse to share their knowledge. Organizations have typically addressed this challenge in two ways: either by creating incentive

programs to encourage sharing of knowledge or by performing intensive studies of expert functions. Neither approach has succeeded. The incentive-based approach fundamentally misunderstands expert motivation, and therefore has not created participation, while the “study the expert approach” is too labor intensive to be easily proliferated.

In sharp contrast, experts using DCT regularly, systematically, and even happily share their knowledge because DCT taps into their intrinsic motivation and communication patterns. DCT asks a series of questions that imitate the questions asked by a new person joining an organization (“naïve new person questions”). In turn, these questions prompt the expert to tell a specialized story called the naïve new person story, first to engage the expert in the process and then to guide the actual knowledge gathering process.

Engagement of the experts typically begins with a brief sequence of questions that motivate expert participation. The questions are:

- How much of your job is in one way or another a repetition of previous work? (rarely less than 60%)
- How do you like doing this part of your job? (typically, “It’s OK, but nothing special.”)
- What do you do with the other 40% of your job? (“The fun things, like creating new projects or working with people.”)

- How do you like doing that portion of your job? (typically, “This is great and fun.”)
- Which element of your work is the primary basis for your economic rewards, the repetitive portions or the creative portions? (“The creative portions.”)
- Would you be willing to spend a little time working with a technology that allows you to spend more time on the creative portions? (“You bet!”)

Now experts are ready to tell their stories. However, in story telling, there are actually two types of stories: “official” stories and “real” stories.

Official stories are the standard information provided in response to a standard inquiry. They are characterized by a formal syntax, a rigid linguistic structure, and a notable lack of energy and passion. Experts resist telling official stories — which are mostly what current knowledge management systems request — because they typically regard them as nothing more than “corporate bull.”

Real stories, on the other hand, are characterized by informal, colloquial language and the experts’ deep passion for the topic. The naïve new person questions in well-designed DCT encourage the experts to tell a “real” story that is similar to the stories they typically tell a new person. Therefore the process feels quite natural to the experts and engages their intellect and emotions. In fact, telling these

stories becomes so powerful and engaging that the experts typically forget about the software by the second screen, and it is sometimes difficult to get them to stop talking.

In addition, unlike most knowledge management systems, DCT has a very simple interface and is designed to promote local empowerment and control. More graphical and centralized systems tend to create a “Big Brother” feeling that actually discourages participation. DCT is designed to create a feeling of comfort and control, making it easy for the experts to engage with the technology and share their knowledge.

In sum, DCT taps into the experts’ intrinsic motivation and natural communication patterns, thereby promoting knowledge sharing.

THE PROBLEM OF KNOWLEDGE REUSE

Getting people to reuse knowledge is a far more difficult problem for the interaction between humanism and technology. People are so inundated with information and so hardened to the dismal attributes of knowledge management systems (such as getting hundreds or even thousands of “hits” in response to a single inquiry) that they reject most knowledge reuse technologies. Here, too, understanding the human processes of how people reuse others’ knowledge is critical for success.

Before we can examine reuse of knowledge, we need a definition of “reuse.” Since there really isn’t

an agreed-upon definition of reuse of knowledge, for the purposes of establishing a common frame of reference, I will use the following definition:

Reuse of knowledge is the application of another person’s knowledge to a new situation, without him or her present, in a way that produces a significant productivity gain.

In order to effectively reuse knowledge, a person must somehow internalize it to the point that it is completely and seamlessly integrated into his or her thought structure and behavioral pattern.

Given this definition of reuse and the related requirement for internalization, we find a limited number of knowledge reuse models, and each has a significant weakness. As shown in Figure 2, there are in fact only three main models (though each has internal variations). These are: printed materials, training, and mentoring. While all are related, they have different characteristics.

Print media such as books and the ever-present corporate binder are inexpensive to produce and expand for additional usage, but they completely lack humanity. In particular, a person attempting to use the knowledge must figure out how to actually apply it, typically with little or no assistance from another person. Costs are low, but so is impact.

Training covers a wide range of activities from lectures to workshops. Lectures have many of the same characteristics as print

Model	Pro	Con
Printed materials	<ul style="list-style-type: none"> • Low cost of distribution 	<ul style="list-style-type: none"> • High cost of development • Limited impact
Training	<ul style="list-style-type: none"> • Moderate cost of distribution 	<ul style="list-style-type: none"> • Moderate cost of development • Moderate impact
Mentoring	<ul style="list-style-type: none"> • High impact • Low cost of development 	<ul style="list-style-type: none"> • High cost of distribution

Figure 2 — Models of knowledge reuse.

media. Adding another person to a lecture is not expensive, but the attendee sitting in the back is decoupled from human interaction and also must apply the knowledge to his or her situation without direct support. Again, costs and impact are low.

Mentoring is the ultimate human-to-human knowledge transfer experience.

There is far more humanism present in workshops, and they have a greater impact because people work directly on applying the new knowledge to specific situations. But it is difficult and expensive to add additional people to the workshop, at least beyond a certain number of participants. Costs and human impact are both moderate.

Mentoring is the ultimate human-to-human knowledge transfer experience. In fact, when people are asked to identify their main mechanism for reusing knowledge, after tepidly mentioning the above approaches, they invariably state

that they call a mentor when it really matters. People learn best from other people. However, while mentoring has immediate impact and applicability, it is very expensive. It takes substantial resources to develop the knowledge required to mentor, and a mentor can only transfer knowledge to a few people at a time. While the impact is high, so are the costs.

The goal of DCT in terms of knowledge reuse is to achieve the “feel” and impact of mentoring at the cost of printing.

HUMANISM AND THE REUSE OF KNOWLEDGE

Well-designed DCT creates the experience of mentoring and therefore creates internalization of knowledge in several ways.

First, the single most important influence on a person’s willingness to internalize another’s knowledge is the belief that the content is “real,” credible, and useful. DCT creates these properties during the harvesting process by engaging the experts’ passion. In turn, when people encounter a real story in

DCT, they immediately sense the passion and commitment to the knowledge. Their response is typically, “Whoever put this stuff in here really knew what they were doing.” The real story comes through loud and clear, producing immediate credibility and a willingness to work with and internalize the content.

Second, DCT simplifies the cognitive process of absorbing knowledge by automatically separating high-level conceptual knowledge from detailed applied knowledge. A high-level conceptual framework, presented through simple screen formats with numerous on-screen prompts, facilitates creation of a mental model by the inexperienced user. Once the conceptual model is understood, it is relatively easy for the inexperienced person to add extensive details, right down to the level of specific “how to” directions. DCT directly facilitates internalization.

Third, DCT overcomes the “not invented here” barrier through the process of “making it you.” “Making it you” imitates how people absorb knowledge when they are the

“second reader” of a document. Second readers edit documents for both content and language, adapting it to their perspective and internalizing it as they edit it. Similarly, in DCT, internalization occurs when an inexperienced person accesses the archived knowledge, sees it displayed on the screen in a structured format, and is guided by on-screen prompts to edit it for their specific situation. The process of editing the expert content converts external knowledge to internalized knowledge. In fact, this process of “making it you” goes so deeply into people’s cognitive structure and behavioral pattern that it actually generates a moral commitment to perform the work as defined by the idealized combination of expert foundation and the “making it you” adaptation.

When joined together, these three attributes tend to produce profound behavioral change much more quickly than is typical of training or other media.

THE NEED FOR LIVE ACTION

Organizations also expect results, compelling people to systematically apply the knowledge to their situation. In fact, experts, in telling their real stories, always include the specific tasks required to perform the expert function. Knowledge is effectively reused only when it is “actionable.” To ensure that the internalized knowledge is actionable, DCT typically has a capability to drive the knowledge into a useful performance plan and schedule

and to track progress against the plan. Understanding humans is again the key to creating this actionable capability.

Tracking progress has been a significant challenge for DCT because knowledge workers universally dislike providing status. Yet many managers effectively track work and intervene appropriately. How could these apparently contradictory human and organizational conditions exist?

Careful observation of effective managers revealed that they consistently ask variations of just four questions. These four questions gathered all of the information needed to effectively manage a department or project. The four questions are:

- “What did you complete?”
- “What will you work on next?”
- “Are we in trouble anywhere?”
- “How can I help?”

While there were different forms for these questions and there were some follow-up questions asked, all good managers used some form of these simple core questions.

It was also discovered that almost all knowledge workers kept some form of “to-do” list and that they derived great joy in their work from crossing items off their list. It became apparent that the items crossed off the list were the responses to the first of the manager questions.

DCT utilizes these two very human traits — the four manager questions together with knowledge worker to-do lists — to create an effective tracking system. DCT usually includes an enhanced electronic to-do list that is preformatted for the managers’ four questions to gather information and report status. It typically takes about six minutes for the knowledge workers to complete the status report and about 90 seconds for the manager to digest it. The human perspective, designed into the technology, satisfies the organizational requirement.

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Finally, people are remarkably intolerant of knowledge they perceive as “old.” DCT addresses this issue with a built-in feedback loop on the best practice. DCT queries the user about possible improvements to the stored knowledge and forwards the response to the original developer of the knowledge, creating a closed loop system. Thus, active users of the knowledge continuously refresh it. In turn, the evolving stored best practice continuously reinforces the credibility of the “real” story, reinforcing the reuse of the stored knowledge. A self-supporting, utterly human, productivity loop is created.

IMPACT OF DIGITAL COACH TECHNOLOGY

DCT can have an extraordinary impact on productivity, such as:

- A test and measurement company reduced the time required to get organized for the launch of a new product from six weeks to just four days.
- A semi-conductor manufacturer eliminated 18 days per manager per year of repetitive activity.
- A shop-floor automation software company was able to support nine implementations simultaneously, with the staffing level that previously only supported three.

The impact of reusing knowledge is staggering. Upon reflection, however, such impacts are not really surprising. We as humans appear to be genetically coded to focus on, and actually overweight, differences in our environment. But much of what we actually do is based on a foundation of repeatable behaviors. If we had to reinvent our response to each situation uniquely, we would be hopeless basket cases, forever stuck just trying to survive. By reusing knowledge, we actually get to rationalize the repeated portions of our behavior to the point where they are very efficient, thereby creating a net productivity gain.

SELLING DIGITAL KNOWLEDGE

DCT can also enable organizations to think beyond just internal

productivity gains to the actual sale of knowledge in digital form. This capability is creating an entirely new market that is truly at the heart of the knowledge economy. Expert knowledge, including everything from subtle sensing mechanisms to specific task lists, can be bought and sold without the human present, because DCT is itself so human oriented.

Companies engaged in the sale and transfer of knowledge, such as training, consulting, and professional services firms, have found DCT to be a particularly attractive proposition. The economic value of the knowledge in these firms has traditionally been limited to billable hours, and billable hours were not easily expandable. The only way for these companies to generate more revenue from their expertise was the expensive and time-consuming process of finding, hiring, and training more people. Even though many of these companies have attempted to productize their knowledge, these efforts have not been wildly successful, and the labor limitations remained.

DCT appears to be the first truly viable means of expanding the value of knowledge without the labor component. It is viable because of the real story and mentoring capabilities and the low cost of replication. The following are some examples of the commercial use of DCT:

- CoreMedia Training Solutions has the Safinos program, which guides people through

the implementation of its well-known Safety Accountability program (www.safinos.com).

- CapBiz has the Path-ligner product, which guides software engineering teams to improved performance (www.icapbiz.com).

LIMITATIONS AND CHALLENGES OF DCT

However, DCT is not without its limitations and challenges. DCT is not effective for all types of knowledge. In particular, DCT is ineffective with highly procedural knowledge such as clerical work, certain types of customer service, and machine maintenance. These are too short-term and focused for DCT to handle efficiently. For DCT to be effective, typically the work must require genuine judgmental expertise and entail a minimum of approximately four weeks of related work. DCT is for larger, longer, and more complex management processes. Perhaps the most critical problem with DCT is that it requires organizational discipline to be successful. While it is relatively easy to get people to share their knowledge (though scheduling is always a problem), the organization must drive consistent reuse of the content. In fact, one group rejected use of DCT because, "This makes us accountable for performing at a very high level." Most of us would think such accountability is a good thing, but a surprising number of people are uncomfortable with the discipline DCT requires for initial

implementation and creates once implemented.

Another problem is choosing the “expert.” DCT assumes that the organization can identify an expert and that the expert has substantive knowledge. However, many organizations resist labeling a particular person or persons “the” expert(s), because this may cause social disruption (even though everyone actually knows who they are). A more common problem is that the expert really doesn’t have expertise. DCT cannot be fooled! If someone is not really an expert, it becomes apparent immediately and can cause social conflicts.

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Finally, many people do not think of DCT as “technology” and therefore resist its use. DCT is not rich in algorithms, the database architecture is relatively unimportant, and it is not particularly exciting in traditional technology terms. In fact, “This is too simple” is a common response to DCT. Thus, in some people’s perception, DCT cannot be effective. There is, of course, an irony here. The very humanistic elements that make DCT an effective medium for harvesting and reuse of knowledge bring it into conflict with some parts of the organization.

ALTERNATIVES TO DCT

But are there alternatives to DCT? Not really. The closest alternatives are personal study of expert behavior and a few process-mapping tools.

The personal study approaches are based on extensive interviews, following the experts around while mapping the process and then converting the knowledge to process binders or training materials. The process is very expensive, cannot be applied to many people at once, and creates an “official story” that has little reuse impact.

Similarly, while process-mapping tools can be used on a mass basis, they typically do not have the level of nuance and detail found in DCT. In particular, they provide little guidance in how an inexperienced person should allocate attention. Each stage of the process seems to carry equal weight. Thus, process-mapping tools create a conceptual framework but are difficult to translate into action.

SUCCESS THROUGH HUMAN PROCESSES

DCT integration of human cognitive processes, organizational perspectives, and simple technology raises the standard for knowledge management technology. No longer will it be satisfactory to have systems that simply transport knowledge. Instead, technology must systematically and consistently utilize natural human processes to be successful.

William Seidman is a recognized thought leader and expert in management decisionmaking and intellectual capital management. In particular, Dr. Seidman is renowned for understanding the processes required to harvest and commercialize expert knowledge. His doctoral work at Stanford resulted in the development of ground-breaking techniques for analyzing management decisionmaking that became the genesis of the Cerebyte Infinos System.

Dr. Seidman has more than 20 years’ experience as a manager of profit and loss centers in high technology companies, including Hewlett-Packard, Silicon Graphics, Mentor Graphics, and Integrated Project Systems, a Silicon Valley consulting company. He is an experienced consultant to and manager of fast-growth, high technology environments. Dr. Seidman is currently leading Cerebyte into a dominant position in the intellectual capital management software market.

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