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Critical errors are made daily in the practice of knowledge management at organizations the world over. Things need to change and knowledge managers must concentrate on the channels through which knowledge flows as much as managing knowledge itself. Here, Dave Snowden looks at three common errors in the KM field and lays the groundwork for learning from the concept of just-in-time KM, which will be covered in a follow-up article.

# JUST-IN-TIME KNOWLEDGE MANAGEMENT: PART I

## Recognizing common KM errors and the progress they inhibit

By Dave Snowden, IBM's Cynefin Center for Organizational Complexity

I first used the phrase Just-in-Time Knowledge Management (JIT-KM) on a conference platform back in 1999 in the context of some recently completed research into the balance of knowledge held in informal and formal communities. I doubt if I was the first and know that I will not be the last. In an excellent *Harvard Business Review* article<sup>1</sup>, Tom Davenport and John Glaser discuss the application of JIT principles. Their proposition is to “embed it (knowledge) into the technology that knowledge workers use to do their jobs”. The phrase is in increasingly common use. One reason for this is the growing recognition that approaches to knowledge management based on the codification of knowledge to databases that operate on a pull basis have largely failed.

Davenport and Glaser recognize this, stating that the focus on networks and communities of practice required knowledge workers to participate in tasks “in addition to doing their regular job. That meant staying a little later each day to share what they’d learned in the course of doing their jobs and coming in a little earlier each morning to learn from others. As a result, the programs, many of which continue today, have been only marginally

successful.” I came to a similar conclusion, but from a different perspective in the article that reported my work on informal and formal communities<sup>2</sup>: “It is not possible to build an intellectual capital management system (ICMS) if we see it as a universal application. Intellectual capital is too diverse, too complex and too heavily dependent on individuals and communities who do not behave rationally. Neither do we want them to behave rationally – to do so would drive out innovation and relationships, both of which are skills for the knowledge economy.”

### A difficult recipe to follow

For Davenport and Glaser, the future rests in “bak(ing) specialized knowledge into the jobs of skilled workers – to make the knowledge so readily accessible that it can’t be avoided.” This is not a revolutionary idea; it has been at the heart of operational knowledge management since the early days of knowledge engineering many decades ago. Plus, it’s a context-specific activity, which reduces the claim that “this method could revolutionize knowledge management.” Davenport and Glaser base their thesis on clinical knowledge, which deals with a finite set of rules and properties and where the overriding criticality of patient care provides focus. This is often not the case in organizational knowledge management projects. Weick and Sutcliffe<sup>3</sup> are in danger of making a similar error in

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## KEYPOINTS

assuming that practices common in high-resilience organizations, such as fire fighting crews and aircraft carriers, can transfer into organizational environments where there isn't a similar single uniting principle or function. In knowledge management, context is the be all and end all of practice. As Davenport and Glaser acknowledge, "embedding knowledge into everyday work processes is time consuming and expensive. It's not an undertaking that anyone in his right mind would tackle without good reason."

Embedding knowledge is one aspect of sound practice.<sup>4</sup> In this article I want to agree with Davenport and Glaser within the context of their research, but will argue that we cannot universalize from that model into other contexts. Secondly, there's a huge area of JIT-KM that can reap a significant return for minimal investment if we focus on accelerating natural processes rather than attempting to impose a "rational" model onto human systems. This complements the expensive, but necessary, task of embedding knowledge and predates it as an idea; it should also come first to prevent wasted money on embedding knowledge where either that knowledge is not susceptible to process or is heavily time-context dependent. A major problem is that the dominant ideology (and it is an ideology) of management science assumes a constrained set of so-called rational practice based on a mechanical design approach that effectively precludes the stimulation of natural forces. This article will therefore deal with the negative before proceeding to the positive in the second article of this series.

### The false promise of mechanical design

There are at least three fundamental errors at the heart of most theory and practice in KM and recognizing these errors is critical to making progress. My intention is to look at each of these in turn, taking a slightly extreme position in each case to make a point against prevailing orthodoxy. The consequence is that we have to take a new look at the management of knowledge, which recognizes that control through pre-determined goals and prescribed behavior has a very limited application. In the next article, summary examples will be given of JIT-KM interventions that do work, but on the basis of triggering ecological change in which the direction can be managed, but not the destination.

*Error # 1: It's assumed that, faced with a choice between one or more alternatives, the individual human actor will make a "rational" decision based on either minimizing pain or maximizing reward. This is not to deny that such targets influence*

- ❶ Approaches to KM that rely on the codification of knowledge have largely failed. Databases that operate on a pull basis aren't naturally used in the workplace.
- ❷ Context is crucial in KM activities. An approach that works in one context won't necessarily transfer well to another context.
- ❸ The Just-in-Time (JIT) concept of KM places emphasis on stimulating natural knowledge flows, in contrast to traditional KM approaches that try to impose rational models onto human systems.
- ❹ Understanding the JIT approach to KM requires recognizing three fundamental errors embedded in most KM practices.
- ❺ After facing these errors, it's possible to find positive interventions that can transform the way we handle knowledge in organizations. Those principles will be presented in Part II of this article series.

*behavior or that they should necessarily be abandoned, but it's to deny that there's a fully manageable cause and effect relationship.*

Humans, individually and collectively, work on the basis of contextual pattern recognition, often at a non-conscious level.<sup>5</sup> Visually, only .01 percent of our visual range is in sharp focus at any time and we see through multiple-point observations, filling in the gaps based on previous experience. Skilled craftsmen train hand-brain coordination in the same way. It also happens conceptually. Those patterns are ingrained based on our own past experience and the collective experience of our culture, often communicated through stories – national and organizational. If the hero stories of our early days of working are of people who held to ethical principles despite the loss of personal reward, then the patterns influence our subsequent behavior. In contrast, a culture based on maximizing personal return has inevitable consequences for ethics. Now humans can overcome this pattern trap, but it's not commonplace. Some key patterns, such as those based on trust, are particularly difficult to influence or direct, as trust is built over years and can be lost in seconds. It can't be trained or enforced.

This patterning of our existence has an obvious impact on decision making with implications for reward and recognition systems. In practice, most incentives are threatened punishments and play to the negative, but also fail to take advantage of existing patterns before they crudely attempt to create new ones. In practice, within existing trusted relationships, knowledge sharing takes place naturally and without inhibition; utilizing this is at the heart of JIT-KM. Attempts to compel behavior through threats and promises tend to induce one of two behavioral patterns:

1. Camouflage behavior, in which knowledge appears to be shared, but is shared in such a manner that it can only be used by reference to the knowledge holder who can then perform a



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- trust validation on the potential knowledge user.
- 2. Conformance, in which time pressure means the minimum possible is done to achieve a measurable goal or target. This is more dangerous than camouflage in that it can lead to false confidence that the knowledge has been fully captured.

It's impossible to measure whether someone is sharing their knowledge, but it is possible to measure if they comply with a process. The mechanisms for process management do not work for knowledge management. There's a growing body of evidence that camouflage and conformance are more common than full knowledge sharing even when there appears to be measurable compliance. Humans are not susceptible to directive control in respect of intangible assets such as knowledge.

*Error # 2: Organizations believe that when experts or other knowledge holders explain how they know something that they are disclosing all that they know; further, that the way knowledge holders say that they know things corresponds with the way that they know things in the field.*

This is a variation of the pattern entrainment referenced above. A simple story will illustrate it from early work using some of the principles of anthropology in knowledge disclosure. The project involved tracking a "trouble shooter" in the oil industry over a week, which involved a scary visit to an offshore rig under fairly extreme conditions. In bad weather, a rig is a very noisy place; wind, the waves, helicopters and the rig itself all conspire to create a cacophony of sound. The experience of the helicopter landing was disconcerting enough, but turning (and shouting) to the trouble shooter to ask how we would go about solving the problem

### Three common errors in knowledge management

In this article, Dave Snowden highlights three assumptions that drive those trying to do KM into dangerous and ineffective territory. Here's a brief summary of each error:

1. Assuming that humans act rationally and that their behavior can be predicted based on cause and effect relationships. Humans act in certain ways based on behavioral patterns. Attempting to reward "unnatural" behavior will not get the knowledge manager very far in his or her efforts.
2. Assuming that experts sharing knowledge are sharing all their knowledge or the "best" knowledge. Humans often don't realize what they know until they're in a situation where they can naturally draw upon that knowledge. Simple models of information and knowledge capture aren't helpful.
3. Assuming that a successful model of behavior can be understood objectively and re-applied systematically. Complex systems can't be managed that way.

that had brought us to this wild place was more so. He said "I already know, can't you hear it?" To me it was noise, but to the trained patterns of his expert mind, he could detect in what he called "the music of the rig" the nature of the problem. By asking how he knew in the context of his knowing revealed over a dozen heuristics, or rules of thumb. In contrast, asking him about problem solving in the reflective environment of an office in Aberdeen produced a logical, rational process of decision making which bore no relation to the reality in the field. If I had created a KM system based on the results of that interview, I would have wondered for years why the real experts didn't use it, despite my attempts to involve them in its creation.

The nature of human knowing in all but the most simple of situations cannot be captured in simple models: think of the many failures of artificial intelligence to replace clinical diagnosis. The embedding of knowledge in the structured process described by Davenport and Glaser is an invaluable, if expensive, augmentation of human intelligence, but as Davenport and Glaser are careful to point out, it cannot replace that intelligence. If I go to a hospital I want to check the record of the surgeon in respect to a particular operation; at a subconscious level, I know that I want evidence that the particular surgeon is not operating from the manual, but is informed by heuristics developed over multiple experiences. In consequence, deployment of deep expertise is beyond the capabilities of scheduling systems or the recipe books favored by too many consultants in and organizational change initiatives.

*Error # 3: The assumption that a successful model of behavior discovered in one situation can be understood in terms of its cause and effect relationships in order to create a model of best practice that can be translated, and frequently mandated, into another situation.*

Again this error is supported by the arguments above in respect to patterning, but can also be understood by making a fundamental distinction between two types of systems:

1. An *ordered system*, in which cause and effect relationships exist, can be empirically discovered, verified and which critically repeat in predictable ways. Such relationships are either known, in which case we can mandate process or are knowable within both an acceptable time scale and resource allocation. This is the dominant system assumption of management science, including most early KM.
2. A *complex system*, in which cause and effect

relationships exist, but they're constantly changing and have many relationships within and outside the system. Moreover, in human complex systems, the nature of identity adds to uncertainty – humans assume and switch unconsciously between many identities without even thinking about it. Such systems can only be coherent in retrospect – once something has happened, we can explain why, but we cannot predict the future. Think of Betamax against VHS as standards for video players. Witness any recession or organizational change initiative and you'll see the operation of retrospective coherence.

There's a third type, namely a chaotic system, which is important in modern knowledge management and particularly for innovation, but it's not central to the argument of this article.<sup>6</sup>


We manage ordered systems by understanding the relationship between cause and effect and then mandating goal-based behavior. Complex systems are very different. We manage complexity by drawing boundaries, to exclude undesirable behavior or to channel the formation of patterns. We also do it through interventions designed to stimulate the evolution of those patterns into desirable forms.

Think of managing children (a metaphor that many a knowledge manager could do with using more often). We draw lines in the sand and say "cross that and there will be consequences." If we draw the line too closely, all authority is lost. We intervene by suggestion or artefact: "Here is a video." or "How about a game of football?" Only rarely do we attempt to impose a structure and it's now sustainable in other than an emergency. The only difference between adults and children is that adults have become adept at camouflage and conformance so we may not be aware that our authority is being flouted.

### JIT KM

The time has come to look at positive interventions that can avoid the errors identified above, but we'll have to save that for the next installment of the article. It's important to emphasize that my overall argument is not that knowledge can't be managed, but that it can't be managed in the sense that a machine can be managed. One origin of the word manage in English is a French word which means the ability to ride a horse in dressage. This is a much more appropriate understanding than command, control and engineering meanings of the process generation.

Stay tuned for a set of principles that aren't

intended to be prescriptive or universal. Each of the principles will be illustrated by a current knowledge management practice – some established, some experimental. By acknowledging the errors treated in this article and combining that with the positive, forward-looking principles of the next, you'll be better equipped to foster knowledge sharing, rather than pursuing doomed attempts to mandate it. 

#### References:

1. Davenport, T.H. & Glaser, J. "Just in Time Delivery comes to Knowledge Management." *Harvard Business Review*, July 2002. pp 107-111.
2. Snowden, D. (1999a) "Liberating Knowledge" Introductory chapter to *Liberating Knowledge*. CBI Business Guide, Caspian Publishing October 1999.
3. Weick, K.E. & Sutcliffe, K.M. *Managing the Unexpected*. Jossey-Bass 2001
4. I am using "sound practice" to replace "good practice," which is a term I would ban from KM; good practice is nearly always entrained past practice.
5. There's a growing range of interesting work taking place in this sector. Gary Klein's book *Sources of power: how people make decisions* should be read by executives and knowledge managers. Also, Andy Clark's *Being There: Putting Brain, Body, and the World Together Again*. Both are published by MIT Press.
6. The nature of these three systems, or ontologies, and their impact on knowledge management is more extensively covered in another article: "Complex Acts of Knowing: Paradox and Descriptive Self Awareness" in the *Journal of Knowledge Management*, Vol. 6, No. 2, (May).

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