

An Excerpt From:

***The New Knowledge Management -
Complexity, Learning, and Sustainable Innovation***

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Chapter 1 - Second-Generation Knowledge Management¹

At a conference on knowledge management (KM) not too long ago, attendees could be heard grumbling about what they felt was the event's myopic obsession with technology. "Document management and imaging – that's all I've seen and heard about here," one man complained. He then amplified his discontent and shared his broader disappointment with knowledge management as a whole: "...an idea that amounts to little more than yesterday's information technologies trotted out in today's more fashionable clothes." Point well taken.

Indeed, at the heart of most KM strategies to date can be found data warehousing, groupware, document management, imaging, and data mining. By continuing to promote that kind of narrow, technology-centric brand of thinking, the nascent field of knowledge management places its own credibility at risk. Merely re-labeling yesterday's technologies in the sexy new name of today's *KM* brings nothing new to the table. And businesses won't stand for it. As reported above, evidence of the backlash is already apparent. We, the community of KM practitioners, can do much better than that.

As an advocate and strong supporter of KM, I and many others hold an entirely different view of the field compared to what we typically see in the press and in trade shows. Recently, a new name for this hopefully more-enlightened brand of KM has emerged: "Second-Generation KM"² (aka, 'The New Knowledge Management.' Unlike first-generation KM, in which technology always seems to provide the answer, second-generation thinking is more inclusive of people, process, and social initiatives. I believe we should embrace this term, along with its expanded perspectives, as a way of differentiating *the new KM* from its technology-minded ancestry. A comparison of these two competing frameworks follows below.

The Fundamentals

The arrival of second-generation KM includes the introduction of some new terms, new concepts, and new insights, which together give second-generation KM some real depth and distinction when compared to first-generation models.

These concepts, of which there are many, include the following ten (10) key ideas:

1. The Knowledge Life Cycle
2. KM Versus Knowledge Processing
3. Supply-Side Versus Demand-Side KM
4. Nested Knowledge Domains
5. Containers of Knowledge
6. Organizational Learning
7. The Open Enterprise
8. Social Innovation Capital
9. Self Organization and Complexity Theory
10. Sustainable Innovation

Each of these concepts is defined and discussed in more detail below.

The Knowledge Life Cycle (KLC)

The conventional practice of knowledge management – if there is such a thing – is often associated with the following common phrases:

- *It's all about getting the right information to the right people at the right time*
- *If we only knew what we know*
- *We need to capture and codify our tacit and explicit knowledge before it walks out the door*

Most of us in KM have heard these expressions many times before. In a very real way, they speak volumes about our assumptions concerning the purpose and value of KM, as well as the scope of it. In particular, the unspoken assumption behind each of these statements is that *valuable knowledge exists* – all we need to do is capture it, codify it, and share it. According to this view of knowledge management, the practice of KM begins sometime after knowledge is produced. Ergo, the purpose of KM is not to enhance knowledge production; rather, the purpose of KM is to enhance the deployment of knowledge into practice (i.e., by taking steps to diffuse it throughout an organization and into the minds of individuals and groups who need it). This is a view of KM that we shall call 'first-generation KM' – a view that places its emphasis not on knowledge production, but on knowledge integration.

While practitioners of first-generation KM tend to begin with the rather convenient assumption that valuable knowledge already exists, practitioners of second-generation KM do not. Instead, they – or we – take the position that knowledge is something that we produce in human social systems, and that we do so through individual and shared processes that have regularity to them. We can describe this process at an organizational level in the form of what is now being

referred to as *the knowledge life cycle, or KLC* (see Figure 1-1). This is perhaps the single most important foundation of second-generation thinking, since most of what we do in KM, according to this view, is designed to have impact on the KLC. If it doesn't have impact on the KLC, or if it is not *intended* to have impact on the KLC, then it is not KM. This is a view of KM that we shall call 'second-generation KM' – a view that places its emphasis on *both* knowledge production and integration.

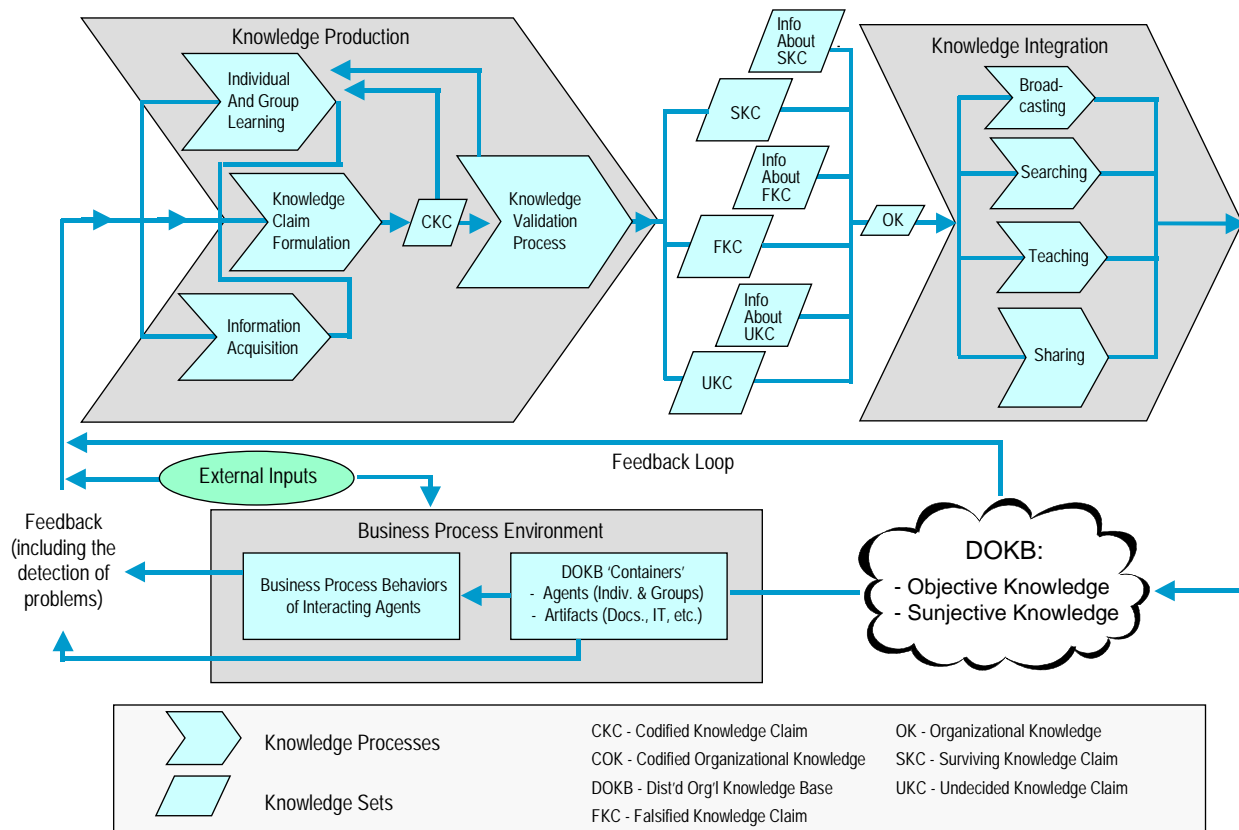


Figure 1-1 - The Knowledge Life Cycle (KLC)³

The KLC shown in Figure 1-1, and referred to variously throughout the remainder of this book, was conceived of, and developed by, a handful of active members at the Knowledge Management Consortium International (KMCI), especially by Joseph M. Firestone and myself. In presenting this model, we often take care to point out that the KLC is actually *not* a 'model,' but is a 'framework,' instead. What we mean by this is that the KLC can be thought of as a *framework for placing models in context*, in which many different competing views of how knowledge is produced and integrated in organizations can be organized and positioned relative to one another in a coherent way. Moreover, management

strategies and programs for enhancing knowledge production, diffusion, and use can be seen in context when viewed against the backdrop of the KLC.

But the KLC is not just a neutral conception, or framework, of how knowledge is produced and integrated in human social systems. It does reflect a particular point of view. Some of the claims embodied in this view include the following:

- People tend to engage in learning as a result of experiencing gaps in their current and goal states. Detections of these gaps constitute the emergence of ‘problems,’ which involve a lack of knowledge of what actions to take in order to achieve desired outcomes.
- The detection of problems by individuals, or *agents*, in a system triggers learning activity which eventually leads to the formulation of ‘knowledge claims.’ Knowledge claims are conjectures, assertions, arguments, or theories about which potential actions might lead to desired outcomes, in ways that will close the gap between current and goal states.
- As they engage in learning and the development of new knowledge claims, individual agents sometimes co-attract one another and form groups in which they collectively, and often informally, share ideas and subject them to peer review, in the broadest sense of this term. In these and other ways, they vet and evaluate their claims to their own satisfaction. At an individual and group level, this may be as far as things need go before being placed into practice, but at an organizational level, validation must also occur in the eyes of a wider audience, if not in the minds of a controlling group or authority structure (e.g., management). This processes of *Knowledge Claim Formulation* and *Evaluation* can be thought of as ‘Knowledge Production.’
- Not all knowledge claims formulated by individuals and groups succeed at an organizational level. Those that do can be thought of as ‘surviving knowledge claims’; those that don’t fall into either of two categories: ‘undecided knowledge claims,’ or ‘falsified knowledge claims.’ Informational accounts about these outcomes are also produced as a consequence of the *Knowledge Production* process. These additional records, themselves, are knowledge claims – or *meta-claims*, if you like (i.e., claims about claims).
- As knowledge claims are evaluated and validated at different levels of organizational scale, attempts may be made afterwards by managers and others to share their content and value with other members of the group or organization, in which case efforts are made to *integrate* them into the operations of a wider population of people. This process of managed knowledge sharing and diffusion can be thought of as ‘Knowledge Integration.’
- As knowledge is successfully integrated throughout an organization, it manifests itself generally in two forms: *mentally held knowledge* by individual or group agents (i.e., knowledge held by people in minds), or held in the form of explicit linguistic expressions in artifacts (i.e., spoken

claims; or claims in documents, computer files, etc.). Here, we find the ideas of the great twentieth century philosopher Karl Popper⁴ to be useful, according to which he distinguished between ‘world 2’ knowledge (knowledge in minds) and ‘world 3’ knowledge (knowledge encoded in linguistic expressions or works of art). Popper also referred to these two forms of knowledge as ‘subjective knowledge’ and ‘objective knowledge,’ respectively. The combination of subjective and objective knowledge in an organization may be thought of as an organization’s ‘Distributed Organizational Knowledge Base,’ or DOKB.

- In discrete form, the components of a DOKB manifest themselves in what we can think of as two kinds of ‘containers’: *agents and artifacts*. More specifically, they may take the form of beliefs or belief predispositions held in the minds of agents (individuals, teams, groups, communities, departments, divisions, etc.) – these are *subjective* forms of knowledge. But knowledge may also be held in the form of linguistic expressions and/or encodings in speech or in objects, such as files, documents, computer systems, microfilm, disks, videos, tapes, books, articles, papers, essays, lectures, music, other works of art, etc. – these are *objective* forms of knowledge, which we can also refer to as ‘knowledge claims.’
- The knowledge life cycle, strictly speaking, begins with the detection of problems by agents in the context of business processing (i.e., while they are engaged in the practice of instrumental behavior, such as business processes, and as they experience gaps in their knowledge of how to move from current states to goal states), and ends with the choice of newly validated knowledge claims, beliefs, and belief predispositions in the DOKB and its containers. Knowledge *use*, which later follows, occurs within the context of business processing, not knowledge processing, and it is in the midst of knowledge use in business processing, in turn, that new problems arise and are detected. In Figure 1-2 we show the relationships between the KLC (aka, the *Knowledge Processing Environment*) and the *Business Processing Environment* – the two realms of processing do indeed connect and interact with one another.

These and other claims, discussed variously below, comprise the theoretical foundations of second-generation KM. Of particular importance is the view that valuable knowledge does *not* simply exist. In fact we produce it, and we produce it as a consequence of engaging in knowledge processes that have regularity to them. Once we learn to recognize and expect this regularity, we can then have impact on an organization’s capacity to produce and integrate knowledge by making a range of interventions aimed at supporting, strengthening, and reinforcing related patterns of behavior. This, then, is the fundamental outlook held by practitioners of second-generation KM, and the KLC is their most important touchstone.

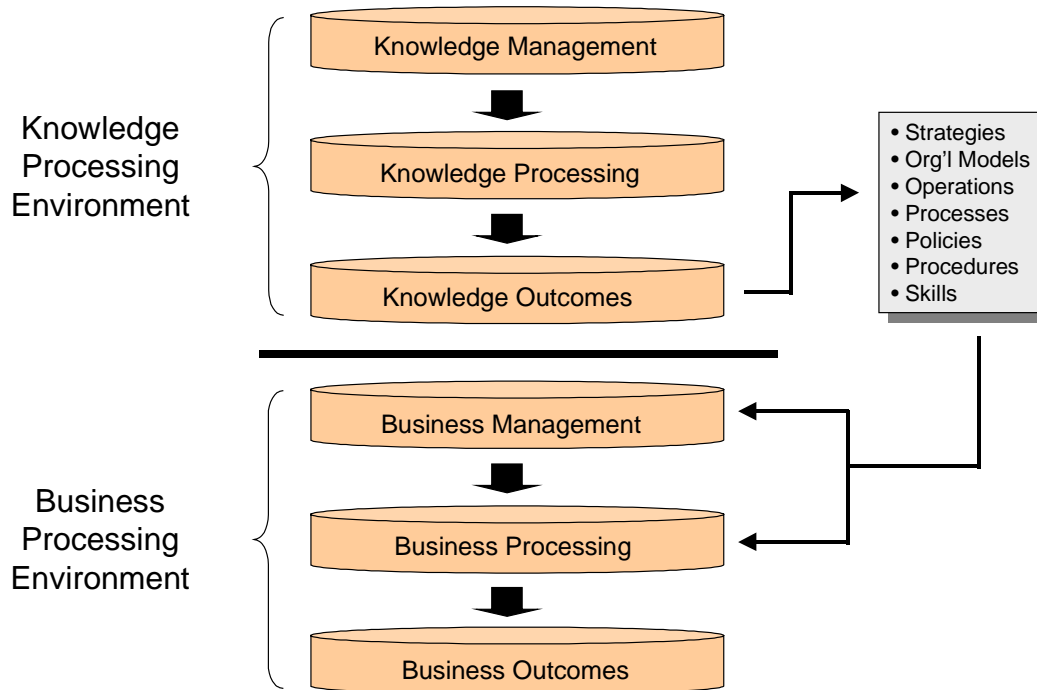


Figure 1-2 - The Relationship Between Knowledge Processing and Business Processing

KM Versus Knowledge Processing

Armed with an understanding of the knowledge like cycle, we can now make the very important distinction between knowledge processing and knowledge management. At an organizational level, people and groups engage in the kinds of activities encompassed by the KLC. We call this 'knowledge processing.' Knowledge processing includes *Knowledge Production* and *Knowledge Integration*, the two major areas of activity within the KLC, as well as their sub-processes. In fact, we can also think of knowledge processing as occurring within the lower levels of scale encompassed by the KLC, namely *Individual & Group Learning*. Individuals and groups also engage in knowledge processing and experience their own knowledge life cycles, accordingly. In this sense, their KLCs are nested within the organizational KLC (discussed further below).

Knowledge management, then, is a management discipline that seeks to have impact on knowledge processing (see Figure 1-3). While the distinction between KM and knowledge processing is a critically important one, the two are constantly being confused with one another in the marketplace. Designing a portal to enhance knowledge sharing is an act of knowledge management because it seeks to have impact on an aspect of knowledge processing as defined by the KLC, namely *Knowledge Integration*. But knowledge sharing is not the same

thing as knowledge management. Nor is engaging with others in, say, a community of practice a form of knowledge management. Rather, engaging in a community of practice is a form of *Individual & Group Learning*, a sub-process of *Knowledge Production*, which, in turn, is a form of knowledge processing.

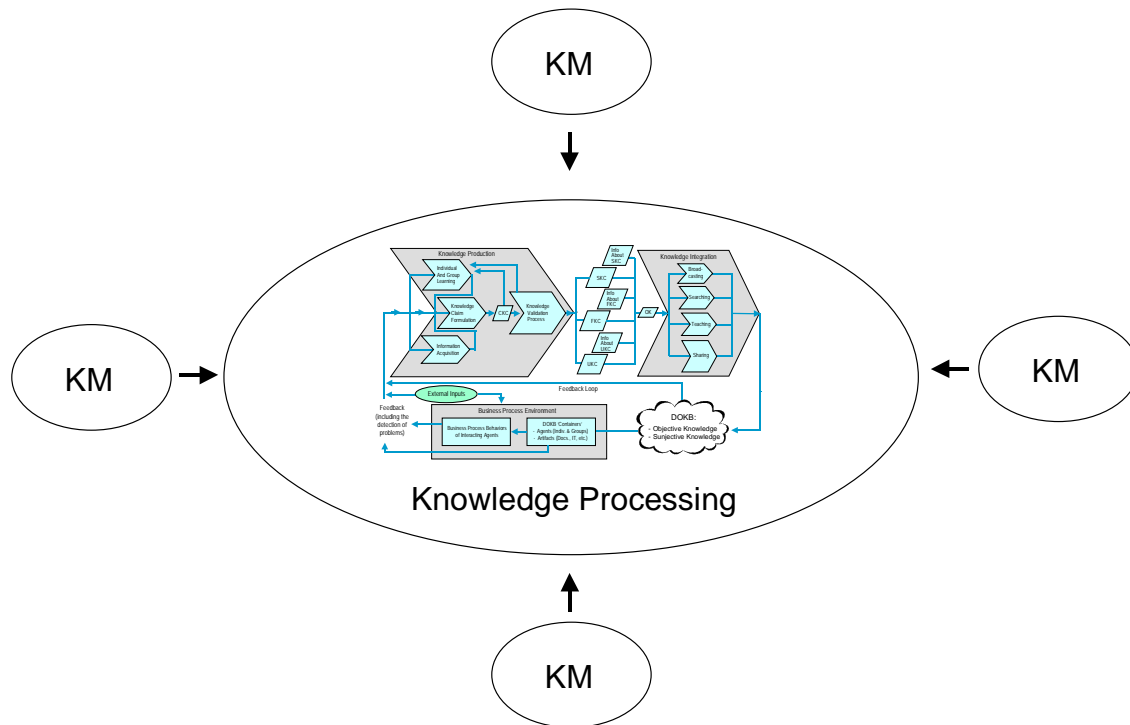


Figure 1-3 - The Relationship Between Knowledge Management and Knowledge Processing

This distinction between KM and knowledge processing is crucial to understanding the meaning and perspective of second-generation KM because without it, there really is no differentiation between first- and second-generation thinking. In first-generation thinking, there is no KLC, no foundational view of knowledge processing, no social process with regularity to it that accounts for *Knowledge Production* and *Integration* in firms, and no conception, therefore, of KM as something which *has impact on* knowledge processing. What there is, by contrast, is an assumption that valuable knowledge already exists, and the sooner we get it into the hands of the people who need it, the better.

Ironically, when viewed from the perspective of the KLC, first-generation thinkers are essentially focusing only on the *Knowledge Integration* side of the cycle, although they might not think of their work in these terms. Moreover, they tend to think of the problem as one of how best to capture, codify, and deploy valuable organizational knowledge. Victory is seen as that pivotal moment in the performance of a business process when a worker suddenly develops a need for

information and is quickly able to find it, thanks to the quality of the 'KM system.' It's all about making the delivery of information successful in support of individual business decisions. First-generation KM is very transactional, in this sense.

Unfortunately, this interpretation of KM has done nothing but confuse the business world for years now, since what's really going on in the scenario above is just information integration (i.e., information or knowledge capture, deployment, and retrieval), and not knowledge management, much less knowledge processing. As discussed earlier above, knowledge differs from information by virtue of the strength contained in the claims about claims (meta-claims). If a knowledge processing system lacks meta-claims of a sort that can tell us what the value, context, or veracity of its information or knowledge claims are, even as it purports to be a 'knowledge management system,' it really is no more than an information processing system. And all efforts to build and deploy it, therefore, are merely acts of information management, not knowledge management.

If, on the other hand, a system is developed in such a way that the information or claims contained in it are accompanied by evaluative meta-claims, the presence of such information can give users access to the arguments *behind* the claims, in which case we're now dealing with a knowledge processing system. All efforts to build systems of that kind could, therefore, be fairly described as knowledge management efforts, but the systems themselves are knowledge processing systems, not knowledge management systems, except in the case where they also support knowledge processing by knowledge managers.

Does this mean that information processing and information management have no role to play in knowledge processing? Of course not. Researching and accessing information (i.e., *Information Acquisition*) plays a significant role in *Knowledge Production* as clearly shown in the KLC in Figure 1-1. But we should not confuse knowledge processing and information processing, and we should certainly not view the knowledge manager's work as 'done' simply because we've made information more generally accessible through technology interventions and otherwise. All of that in the absence of validation information (meta-claims) is nothing more than information management and information processing. Knowledge managers should never forget this.

Supply-Side vs. Demand-Side KM

As I have explained, the hallmark of first-generation KM is its overwhelming emphasis on the capture, codification, and distribution of existing knowledge throughout an organization. This accounts for the heavy use of technology in most first-generation initiatives. Groupware, information indexing and retrieval systems, repositories, data warehousing, document management and imaging

systems are all classic answers to the prevailing ailment first-generation KM strategies are designed to address: *inadequate knowledge sharing*.

All of these measures are seen as superior to serendipity or manual efforts when it comes to propagating knowledge from one part of the organization to another. Enhance the transfer of knowledge, first-generation KM practitioners argue, and better organizational performance will follow.

KM interventions aimed solely at the enhancement of knowledge sharing, or integration, can be thought of as 'supply-side' in their orientation because of their focus on enhancing the supply of existing knowledge to people who need it. In other words, supply-side KM focuses only on the *Knowledge Integration* side of the KLC (see Figure 1-4).

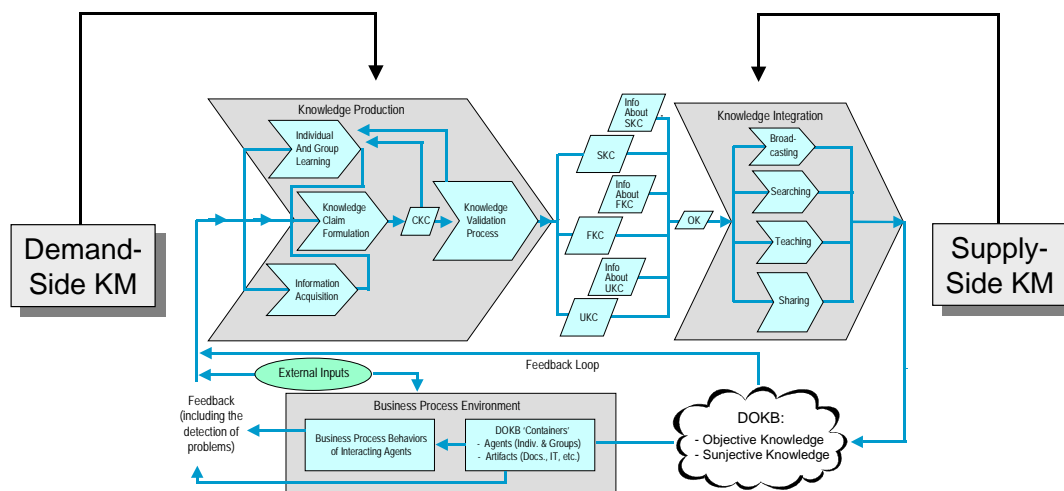


Figure 1-4 - The Different Targets of Supply- Versus Demand-Side Knowledge Management

'Demand-side KM' takes a distinctly different point of view. Rather than place its bets on the downstream effects of codifying and sharing *existing* knowledge, demand-side advocates suggest, instead, that accelerating the production of *new* knowledge is a far more valuable proposition. Practitioners of demand-side KM are, therefore, mainly interested in enhancing an organization's capacity to satisfy its *demands* for new knowledge. As a result, demand-side KM initiatives focus on enhancing the conditions in which innovation and creativity naturally

occur – they focus, that is, on the *Knowledge Production* side of the KLC (see Figure 1-4).

Helping organizations to create new knowledge faster (i.e., to accelerate their rate of innovation) is seen by demand-side thinkers as a powerful new way of increasing a firm's competitive stance in the marketplace. This message has not been lost on practitioners of second-generation KM. In fact, whereas first-generation KM can be thought of as equivalent to supply-side thinking only, practitioners of second-generation KM embrace *both* supply-and demand-side KM, thereby bringing a considerably more balanced view to the table (see Figure 1-5).

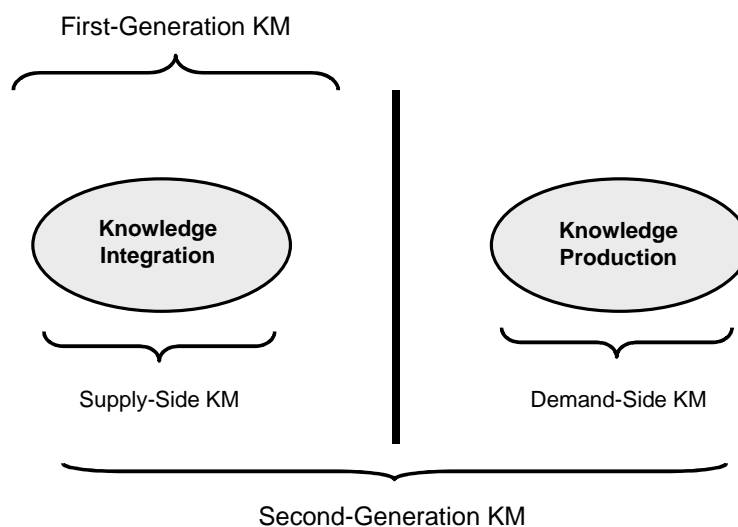


Figure 1-5 - First- Versus Second-Generation Knowledge Management

Nested Knowledge Domains

The Knowledge Life Cycle shown in Figure 1-1 is 'expressed' at the level of an organization. In other words, it depicts the dynamics of knowledge production, integration, and use at a *whole enterprise* level. Embedded within the organizational process, however, are individuals and groups who also learn, and whose patterns of learning may also be described as a KLC. Indeed, *Individual & Group Learning*, per se, is explicitly shown as a sub-process in *Knowledge*

Production since *their* learnings contribute in material and often determinative ways to the direction of organizational learning.

What this means is that there are really three levels of learning, or *knowledge domains*, in an organization: the top level organization or enterprise; sub-groups within the organization; and individuals, some of whom may be members of groups while others are not. Individuals are nested in groups, and groups are nested in organizations (see Figure 1-6). As a result, the *Individual & Group Learning* sub-process in *Knowledge Production* actually contains many lower-level KLCs, which in some organizations may number in the thousands, if not more. Still, second-generation KM is primarily concerned with the KLC operating at the level of the enterprise, but it recognizes the presence of lower-level KLCs and explicitly takes them into account in the formulation of its strategies and interventions.

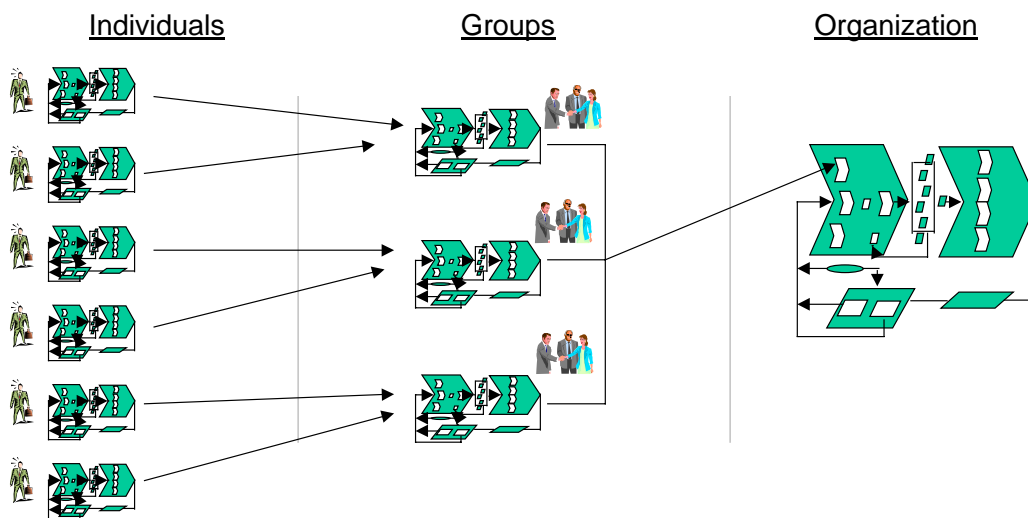


Figure 1-6 - Nested Knowledge Domains

It is also not only true that each knowledge domain in a system has its own KLC, but also its own independent outcomes. In other words, what's true for me (my validated knowledge claims) may not be true for you, because we each have our own separate KLCs, and my validation criteria may differ from yours. Savvy knowledge managers know this. When crafting KM strategies at an organizational level, it is often helpful to begin by acknowledging the presence of

multiple KLCs, each of which may have its own *Knowledge Claim Evaluation* criteria. How can we expect people and groups in organizations to agree with one another without at least attempting to rationalize our KLCs and the potentially conflicting criteria we use in evaluating knowledge claims – even when we’re dealing with the *same* knowledge claims? Here again, use of the KLC as a reference model for planning KM interventions can really pay off, since if it were not for the presence of the *Knowledge Claim Evaluation* sub-process in the context of nested knowledge domains, we might fail to even acknowledge the issue as one that we should be focusing on.

Containers of Knowledge

As noted above, the DOKB shown in Figure 1-1 manifests itself in the *Business Processing Environment* in the form of what we can think of as ‘containers’ of knowledge. These containers are made up of agents (individuals and groups) and artifacts (documents, books, computer systems, etc.). Knowledge held by agents is subjectively held in minds, whereas knowledge held in artifacts is objectively held in the form of explicit, encoded linguistic expressions. When we view knowledge in this way, we can think of everyday expressions of knowledge in organizations in the ways shown in Table 1-1.

Instantiations of Knowledge	Examples	Objective	Subjective
1. Personally-held Beliefs In An Individual (Mind)	An Opinion		✓
2. Mutually-held Beliefs In A Group (of Minds)	A Business Process		✓
3. Mutually-held Beliefs In An Organization (of Minds)	A Business Strategy		✓
4. Claims Expressed In Written Form	A Report	✓	
5. Claims Expressed In Computers	An E-mail	✓	
6. Claims Expressed In Audio-Visual Form	A Documentary	✓	
7. Claims Expressed Orally In Person	A Speech	✓	

Table 1-1 - Containers of Knowledge

The significance of *Containers of Knowledge*, when viewed from this perspective, is that they hold and reflect the knowledge claims we produce in our KLCs. In addition, they can be seen as the interface between knowledge processing outcomes (the DOKB), and the Business Processing Environment in which decisions and actions are taken by people in their work. The ‘containers’ perspective is also important because it can serve as a basis for discovering and mapping knowledge.

Organizational Learning

Perhaps the most striking distinction between first- and second-generation KM is the explicit connection now being drawn between second-generation thinking and organizational learning (OL). Popularized by Peter Senge in his hugely influential book, *The Fifth Discipline (1990)*⁵, OL has attracted an enormous following and is widely regarded as a reference to the only sustainable advantage in business: *the ability to learn faster than your competitors*. OL, therefore, focuses on how to create and foster effective *Knowledge Processing Environments* in human social systems. Second-generation KM, in turn, is all about beefing up an organization’s ability to do just that – to learn, and to effectively learn in sustainable ways.

I like to think of second-generation KM, then, as a management discipline that focuses on enhancing organizational learning. In other words, second-generation KM is an *implementation strategy for organizational learning*. Knowledge management and Senge’s OL movement have much to gain by embracing this convergence of thinking, the combination of which is much greater than the sum of its parts. What a fitting tribute to Senge’s OL ideas, which after all, highlight holistic *systems thinking* as the *fifth* discipline he speaks of. Aiming our interventions at the entire KLC, not just some of its parts, is nothing if not systems thinking in the finest tradition. But rather than using systems thinking *for* learning in the Sengian sense, second-generation KM uses it to describe a vision *of* learning. *The KLC is a systems-thinking representation of how learning happens in human social systems!*

The Open Enterprise

To the extent that the KLC, or knowledge processing, comprises a social system, it will invariably have a political dimension to it. For example, in contemplating the execution of knowledge processing in a firm, we could reasonably ask the following questions:

- Who’s responsible for the detection of problems and opportunities in the business processing environment?
- Who gets to engage in *Knowledge Claim Formulation* on behalf of the organization? Everyone? Senior management, only?
- Whose opinions matter in *Knowledge Claim Evaluation*?

- What responsibility does management have to reveal its knowledge claims and the reasoning behind them before adopting them into practice?
- What rights do non-management workers have in a firm to participate in, or at least have visibility into, management's deliberations over competing knowledge claims?

With these kinds of questions in mind, we can easily imagine knowledge processing environments that might be more or less open to including the broader population of a firm when it comes to *Knowledge Claim Formulation, Evaluation*, and adoption by management. The more restrictive management is in the conduct of its knowledge processing affairs, the more 'closed' a firm would be; the more inclusive management is, the more 'open' a firm would be. Moreover, we could further surmise that *openness* is a better policy, since it tends to result in the adoption of stronger, more rigorously tested knowledge claims, even as it engages the knowledge processing power of *whole firms*. I like to think of this in terms of the difference between *enterprise-wide innovation* and *management-wide innovation*. Enterprise-wide is better.

In their fully elaborated, native, self-organizing form, knowledge processing systems, or KLCs, are politically open – utterly so. Here, consensus-based approaches where everyone has a say in what gets done, often at the expense of agility or responsiveness, is the norm. In business organizations, however, where agility and responsiveness in the marketplace matter greatly, we see less open knowledge processing going on, with knowledge-making being relegated to the hands of managers, who also hold power over decision-making. But political control over decision-making need not restrict access to knowledge making to only the hands of the decision-makers. Rather, we can envision organizations in which knowledge processing is more open to the populace, so to speak, even as decision-making authority is not.

Some of us in the field of second-generation KM are beginning to refer to this vision of openness in the KLC as the 'Open Enterprise,' or OE, for short. In particular, several members of the KMCI, including myself, Joseph M. Firestone, and Mark A. Notturmo, have started to formulate this idea in further detail. To be sure, the idea of the OE is firmly rooted in the thinking of the great twentieth-century philosophy Karl Popper⁶, whose notion of the 'Open Society' followed from his adherence to what he called 'Critical Rationalism,' an approach to learning and knowledge production that stresses the fallibility of knowledge. And since all knowledge is fallible, Popper felt that we should be *rationaly open* to criticism of the views that we hold dear, and never constrain inquiry. As another great late nineteenth and early twentieth-century philosopher, C. S. Peirce, put it, "Do not block the way of inquiry."⁷ Think of this as the motto of the Open Enterprise.

In his very fine book, *Science and the Open Society*⁸, Notturmo explains the ethic of *openness* this way:

“We are rational to the extent that we are open to criticism, including self criticism; and to the extent to which we are willing to change our beliefs when confronted with what we judge to be good criticism.”⁹

Turning back to organizations, or businesses if you like, we can ask ourselves what openness would look like in the conduct of commercial affairs – knowledge processing affairs, that is. As I write this essay, the United States is still reeling from the largest bankruptcy in American history, the collapse of the Enron Corporation. While time will tell what really happened there, early indications suggest that far from being a surprise, Enron’s over-reliance on dubious accounting practices was known by several members in the firm, but were suppressed by others in higher positions of power. ‘What if the broader population of Enron’s executives, workers, and stockholders had been privy to its shenanigans?’ one might ask. Would things have gotten as far as they did? Or would the behaviors that ultimately cost the company its survival, and its employees and stockholders their nest eggs, have been nipped in the bud early on?

In the wake of Enron’s demise, talk of new regulatory interventions aimed at preventing this sort of thing from happening again is boiling in the press with intensity. And while most of the ideas being considered will in all likelihood lead to constructive outcomes, they at the same time arguably fail to address the core problem that led to Enron’s collapse – closedness in its KLC! Again, as Mark Notturmo put it, “We are rational to the extent that we are open to criticism...” And so we might speculate that Enron, from a cultural point of view, was irrational to the extent that it failed to allow itself to benefit from the well-meaning criticisms of its own people. Indeed, accusations have been made that management there went so far as to deprive its *own people* of access to information concerning its management decisions, even within the ranks of management itself.

In response to the Enrons of the world, KMCI has started working on the development of a set of policies and programs that would seek to ensure openness, not in the *decision-making* process of a firm, for that would unduly interfere with its operation, but in its *knowledge-making* process. In other words, we are starting to formulate a *normative model for openness in the KLC*. Of particular interest to us are steps that could be taken by management and the Board of Directors in a corporation to ensure that there is sufficient openness in the *Knowledge Claim Formulation* and *Knowledge Claim Evaluation* sub-processes of the KLC. Openness, in this sense, would not in any way undermine the authority of a management regime, but would merely subject its ideas and plans to the bright light of day. Workers, stockholders, and other stakeholders in

a firm would have access to not only the knowledge claims held by managers, but also to the knowledge processes, as well, through which management knowledge is produced.

Examples of concrete steps that companies could take in pursuit of the OE might include the implementation of what I call 'free employee presses,' or FEPs. An FEP would be a publication in which employees' views on opinions held, and decisions made, by managers could be constructively criticized in an open way. Access to the FEP would be possible for all employees, as well as by board members and stockholders, whose vested interests in the quality of management thinking and decision-making would be well served by such institutions. And further, of course, this kind of visibility of management should help to prevent the suppression of information and the temptations of unscrupulous managers to keep illicit or dubious behaviors secret in the first place.

But then there's the problem of retribution. How would we prevent managers from taking retaliatory actions against those of their subordinates who openly disagree, or criticize them in print, as it were? In a recent exchange on this very question, Joseph M. Firestone made the following very interesting proposal¹⁰:

"The Managers, the Board and the stockholders must all agree to accept and support the defining specifications of the OE. Among the defining characteristics will be agreement on the part of Managers, the Board and stockholders, that they will maintain and support a hands-off policy toward interference with, or punishment of, peer-group-directed communications in any venue (Communities of Practice, FEP, List Serve, Chat Room, etc.) designated as an OE venue when it first receives management approval. Management should specifically be denied the authority to manage such venues once they are formed, and a specific institution reporting directly to the Board and the stockholders, the Ombudsman's office, should be established with enough resources to study the pattern of punishments and rewards given to participants in the knowledge-making venues, as compared with the pattern of punishments and rewards given to non-participants.

The CKO/Ombudsman should also have the duty of, as well as the resources for, hearing complaints for retributive actions performed by managers, and for binding arbitration of such disputes. The Ombudsman, who would have the authority to recommend dismissal of Managers for violation of the non-retribution policies to higher management, to the Board, and even to the stockholders, would not be responsible to Management in any way for his/her employment, but would serve only at the pleasure of the stockholders, as the Board does."

One of the elements of this proposal that I particularly like is its implication that the KM function might report to the board in a corporation, and not to its management hierarchy. I have been making this point, myself, in recent years, and have pointed out that a management hierarchy, itself, along with all of its strategies, operating models, and policies, are nothing more than a collection of knowledge claims that are temporal – and fallible – in scope. To subject knowledge management to the control of a current management regime is a little bit like putting the Pope in charge of enforcing religious openness. Management and strategy *follow* from knowledge processing, not the reverse. The KM function should be positioned, accordingly.

Another aspect of an OE, one that is already practiced by many companies around the world, in the process of co-determination, might be to populate the board with one or more employee representatives elected by their peers. Here again, the objective is openness in *Knowledge Production*, and by permitting employee representatives to sit on its board, a company can avail itself of the knowledge claim contributions of its entire population – a population that is often disenfranchised from the *Knowledge Production* process, altogether.

It will be interesting to see where the KMCI's conception of the OE ends up in its final form. Again, it is still very much in its formative stages. Nonetheless, it does point to the potential for a very real benefit that second-generation KM can bring to the table, but which first-generation thinking cannot: *higher quality knowledge processing in commercial firms, and a reduction in management malpractice, errors, and deceit.*

Social Innovation Capital

Even as the professions of knowledge management and organizational learning have been evolving along their own parallel, and sometimes intersecting, paths over the past ten years, so was the exploding new field of intellectual capital (IC) finding its own way into the world. What initially caused interest in this important new field of management was the sudden appearance of widening disparities in company values, as measured by the gaps between their market capitalizations and their book values. Starting roughly in the late 1950s, the gap between these values, as displayed by the Dow Jones Industrials, started to widen significantly (see Figure 1-7). The difference between them is now generally attributed to the value of so-called 'intangibles,' which is at least inclusive of intellectual capital, depending on whose definition of the terms you subscribe to.

Since today's Generally Accepted Accounting Principles (GAAP) do not provide for the measurement and reporting of intellectual or intangible capital, what most of the discussion in the IC arena has been all about is how to do just that: *measure and report on the value of intellectual capital.* Suffice it to say that the accounting profession's failure to, well, *account* for the value of what many publicly-traded firms are, in fact, worth has been seen by many as untenable.

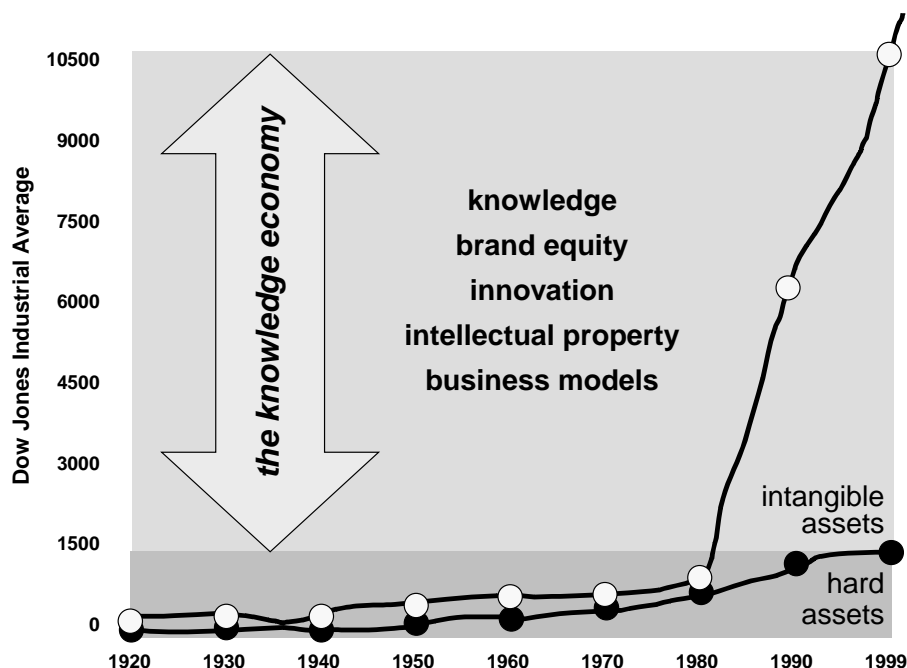


Figure 1-7 - New Economic Models: Book Value & Market Value¹¹

And so the work continues to try and find a standardized way of solving this problem.

Like many in the fields of KM and OL, I am quite content to defer to the accounting profession to work this out, but according to my own review of the literature in this area, something of enormous importance has been missing: *the KLC!* In other words, what most, if not all, of the competing views on how to measure and report intellectual capital have failed to do is to reflect the enormous value of a firm's capacity to produce and integrate its knowledge. To my mind, this is a kind of *social capital*. It refers to an organization's social capacity to innovate (i.e., to produce and integrate new knowledge) as a component of its value. I call this form of social capital 'social innovation capital,' or SIC.

Since first-generation KM always begins with the view that valuable knowledge exists, there is no social process in first-generation thinking that we can put our fingers on and point to as a source of value in a firm. There is only the value of knowledge outcomes (or *knowledge*), which when properly codified and deployed to a worker confers value to the organization by virtue of his or her successful performance. Only second-generation KM, with its view of knowledge processing as a social process unto itself, can speak in coherent terms about the value of *Knowledge Production* and *Integration* as an important consideration in

computing the IC value of a firm. After all, the only thing more valuable than valuable intellectual capital is the organizational capacity to produce it!

IC measurement and reporting schemes that fail to take SIC into account (i.e., by failing to explicitly reflect the economic value of the KLC in their taxonomies) are arguably incomplete, and are just another vestige of first-generation thinking spilling over, this time, into the field of management accounting. It is encouraging to note, however, that many in the field of IC have come to regard missing SIC as a serious oversight, thanks to the pioneering efforts of thought leaders in second-generation KM.

Self Organization and Complexity Theory

Most of the ideas expressed in this paper are firmly rooted in complexity theory. Now seen as a valuable source of insight in understanding how living systems function – including human organizations – the science of complexity has a great deal to say about the nature and role of cognition in the conduct of human affairs. Indeed, second-generation KM owes much of its thinking to complexity theory.

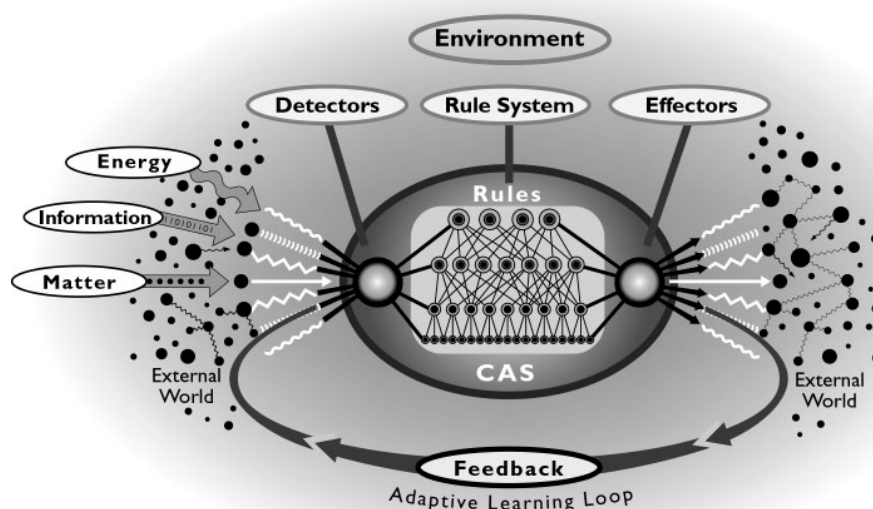
Of particular relevance in the *science* of complexity is a body of thought known as *complex adaptive systems theory*, or CAS theory.¹² CAS theory holds that living systems (i.e., organizations made up of living, independent agents, such as people) self-organize and continuously fit themselves, individually and collectively, to ever-changing conditions in their environment.¹³ They do this, the theory says, by (in our terms) formulating and testing their beliefs and belief predispositions (“mental models”) as a way of solving their problems and getting on in life (see Figure 1-8).

Knowledge (in the form of “mental models”), according to CAS theory, can be represented by ‘rules’ that agents (or *people*, in our case) follow in their ongoing attempts to adapt themselves successfully to their environment. Rules, in this sense, are roughly equivalent to our notions of beliefs and belief predispositions. CAS theory, then, is one of the important theoretical foundations behind second-generation KM and its concepts of the *Knowledge Life Cycle*, *Knowledge Processing*, *Knowledge Claims*, *knowledge in the mind (beliefs and belief predispositions)*, and *Containers of Knowledge*. Moreover, living systems are *nothing* if not *Learning Organizations*. Understanding how knowledge forms at the level of individual agents and then influences knowledge formation at the level of *the collective* to produce shared organizational knowledge is a lesson taken directly from complexity theory. So, too, is the notion of *Nested Knowledge Domains*, which CAS theory sees as organisms or groups within groups, each of which is capable of evolving its own sets of rules through its own KLC.

The application of complexity theory to a broad range of business and organizational development issues is widening in practice. Examples include the *New England Complex Systems Institute* in Cambridge, MA, whose members

have been actively studying the application of complexity and CAS theory to the management of human organizations for years now. Major corporations have also risen to the occasion by investing in dedicated resources, such as Citibank's *Complexity and Organizational Behavior Project*, to explore and embrace ways of applying complexity's lessons to the management of their affairs. Even the *Wall Street Journal*, thanks to the pioneering efforts of journalist Tom Petzinger, has closely followed the trajectory of complexity theory as practiced by business since the mid-'90s.¹⁴

Complex Adaptive System (CAS) Model



Source: www.idiagram.com

Figure 1-8 - Complex Adaptive System (CAS) Model¹⁵

But it wasn't until 1997, when the Knowledge Management Consortium International was formed (KMCI) that the profound connections between complexity theory and knowledge management were deliberately embraced. By simply agreeing to treat human organizations as living systems – consistent with CAS theory's definition of *complex adaptive systems* – all of the theory's insights on how knowledge *happens* in such systems were suddenly seen as entirely applicable to business and industry. Readers of this book should make no mistake about it: *practitioners of second-generation KM believe that people in organizations tend to self organize around the production, diffusion, and use of*

knowledge, and the KLC is the pattern of organizational behavior that follows. It's an emergent property of human social systems. This insight, coupled with the influence of organizational learning on KM, accounts for the strikingly new and different brand of *second-generation knowledge management* that we now see before us – a practitioner's framework firmly rooted in the study of *complex adaptive behaviors* in living systems.

Sustainable Innovation

In my discussion of social innovation capital above, I stated that “the only thing more valuable than valuable intellectual capital is the organizational capacity to produce it!” In truth, however, there is one other thing more valuable to an organization than its social capacity to innovate, and that is *its social capacity to innovate sustainably*. What do I mean by this? Again, we can turn to the KLC for guidance.

According to second-generation thinking, not only is knowledge processing a social process, but it is a *self-organizing* one, as well. In other words, people in organizations have a tendency to self-organize around the production, integration, and use of new knowledge. Further, I have argued that patterns form between people at an enterprise-wide level as they do so. Individuals engage in *Information Acquisition*; groups or communities form; knowledge claims are produced; some claims are validated, while others are not; validated claims go on to become integrated within the organization via a variety of means; etc. These and other aspects of the KLC are self-organizing in their expression, but they are no less predictable in terms of their arrival. People engaged in problem-solving and learning at an organizational level invariably tend towards the behaviors portrayed by the KLC.

One of second-generation KM's fundamental precepts is the claim that because knowledge processing is a self-organizing social process with pattern-like regularity to it – one which people in organizations involved in problem-solving and learning ineluctably *tend towards* – KM interventions aimed at supporting such patterns will always lead to more sustainable innovation than those which do not. Why? Because their behavior goals are consistent with what the predispositional tendencies of the system already happen to be. This is a simple matter of either *working with the system or against it*.

Fortunately, but not surprisingly, the behavioral tendency of interest here is a desirable one. *We want* people in organizations to focus on solving problems when they occur, and to collaborate with one another in the search for solutions. This is consistent with the pattern displayed by the KLC. KM interventions designed to enhance the pattern, therefore, are arguably more sustainable than those that do not. And they are certainly more sustainable than KM schemes which result in *conflicts* with the KLC. Conflicts of what sort, you may ask?

Let us turn again to Enron. What managers at most companies fail to do – and especially at Enron, it seems – is to separate in their minds the difference between decision-making versus knowledge-making. We explored this issue above in our discussion of the ‘Open Enterprise,’ but it has everything to do with the sustainability of knowledge processing or innovation, as well. Decision-making on behalf of a firm is the province of managers; there’s no question about that. To challenge that premise would be to compromise the stability and effectiveness of private firms, and that is certainly not my intent. But to restrict knowledge processing, or knowledge making, to the hands of managers is sheer folly, and is utterly unsustainable because it fails to exploit the knowledge processing capacities of whole firms and the people who inhabit them.

This is arguably what happened at Enron although, as I say, time will tell. The initial record, however, suggests that knowledge of Enron’s dubious accounting practices was held close to the vest by its senior managers, and was therefore not open to scrutiny by such interested stakeholders as its board, employees, and stockholders. In other words, Enron was practicing knowledge produced by a small band of leaders, whose claims had not been subjected to anything close to the openness specified by an ‘Open Enterprise’ model, much less the bright light of day. And even when objections were raised concerning the validity of such practices, that part of the KLC was closed – decision- *and* knowledge-making authority were co-confined to a small band of leaders, and the rest, of course, is history.

Successfully managing for sustainable innovation, then, begins with recognition of the distinction between *decision-making* (the province of management) and *knowledge making* (everyone’s job). Next is acknowledging the self-organizing nature of knowledge processing systems, a pattern-like social process that we can describe by the KLC. And finally, we can achieve sustainable innovation by choosing learning-related policies and programs that serve only to support, strengthen, and reinforce the KLC. Anything less than this is ultimately unsustainable because it conflicts with the intrinsic tendency of organizations to innovate in their own particular ways.

This is what we mean by sustainable innovation, an insight unique to second-generation KM whose lineage, however, is deeply rooted in organizational learning and complex adaptive systems theory.

Chapter 1 Endnotes

¹ This chapter was originally published in October, 1999 as an article under a similar title, but has been substantially edited since then to reflect changes in the industry: M. W. McElroy, “The Second Generation of Knowledge Management,” *Knowledge Management* (October, 1999), pp. 86-88.

² M. W. McElroy, “The Second Generation of Knowledge Management,” *Knowledge Management* (October, 1999), pp. 86-88.

³ The KLC was developed by members of the Knowledge Management Consortium International (KMCI), a U.S.-based non-profit association of knowledge and innovation management professionals from around the world (www.kmci.org).

⁴ K. R. Popper, *Objective Knowledge* (Oxford, England: Oxford University Press, 1972), Chapter 3.

⁵ P. M. Senge, *The Fifth Discipline* (New York, NY: Currency Doubleday, 1990).

⁶ K. R. Popper, *The Open Society and Its Enemies* (London, England: Reprinted by Routledge, 1998).

⁷ C. Hartshorne and P. Weiss [Editors], *Collected Papers of Charles Saunders Peirce* (Cambridge, MA: Harvard University Press, 1931 – 1958), pp. 135-140.

⁸ M. A. Notturmo, *Science and the Open Society* (Budapest, Hungary: CEU Press, 2000).

⁹ *Ibid.*, p. xxv.

¹⁰ This proposal was made by Joseph M. Firestone by e-mail in an on-line discussion group moderated by the Knowledge Management Consortium International (kmci-virtual-chapter@yahoogroups.com) in February, 2002.

¹¹ Adapted from: *Fourth Generation R&D: Managing Knowledge, Technology, and Innovation*, by William L. Miller and Langdon Morris, figure I.1, page xiii. (John Wiley & Sons, 2000); based on data from Value Line Publishing, Inc. Used by permission of Langdon Morris.

¹² See, for example: J. H. Holland, *Hidden Order - How Adaptation Builds Complexity* (Reading, MA: Perseus Books, 1995).

¹³ See, for example: R. D. Stacey, *Complexity and Creativity in Organizations* (San Francisco, CA: Berrett-Koehler Publishers, 1996).

¹⁴ For a collection of Tom Petzinger’s articles written on related subjects, see: T. Petzinger, Jr., *The New Pioneers* (New York, NY: Simon & Schuster, 1999).

¹⁵ This illustration was created by Marshall Clemens of Idiagram Co. in Lincoln, MA (www.idiagram.com)

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