

Sustainable Innovation and the ‘Learning Drive’

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Introduction

Historians of late-twentieth/early-twenty-first century management practices may very well record the failure of business process reengineering (BPR) as comprising the death knell for reductionist thinking in post-modern times. Indeed, the very idea that people operating in nonlinear social systems could be manipulated with precision like so many belts and pulleys in a grist mill seems, in retrospect, even to contemporary Taylorists, like mechanistic thinking run amuck. ‘*What could they possibly have been thinking?*’, historians will ask, as they look back on the crash of reductionism and the rise of systems thinking in its wake. We are arguably on the threshold of a new paradigm in management theory and practice, the effects of which are now being felt in earnest on several important fronts. One of them is in the intellectual asset, or knowledge management, arena.

Despite its checkered reputation thus far, knowledge management (KM) is proving resistant to criticism while its practitioners are becoming increasingly more sophisticated, all the while. And why shouldn’t KM exhibit that kind of resilience? After all, the proportion of economic value now attributed to so-called intangible or intellectual assets in business is higher than ever (75% of market values as reflected in the Dow Jones Industrial Average in 1997)¹. By contrast, as recently as 1980, the same index reflected market values owing to intangible assets at ‘zero dollars.’ In other words, the value of the DJIA in 1980 – only twenty years ago – was solely confined to traditional book values, or hard assets. Since then, the value of intellectual assets as a component of total *market caps* has increased exponentially. No wonder, then, that a whole new breed of professionals has emerged in a field we now call, ‘knowledge management.’

In my own efforts to characterize the conventional practice of knowledge management, I have found it useful to differentiate between what I call *supply-side* versus *demand-side KM*.² In general, supply-side thinking focuses on the *sharing* and *distribution* of *existing* organizational knowledge, while demand-side thinking focuses on the *production* and *application* of *new* knowledge. Most of the KM thinking and hype in the marketplace to date has been firmly rooted in supply-side propositions. I call this (supply-side-only) orientation, ‘first-generation knowledge management.’³

More recently, however, a new breed of KM practitioners has embraced the mystery of knowledge production, and is beginning to think more in terms of whole knowledge lifecycles that include *both* knowledge production *and* sharing. After all, valuable organizational knowledge presumably comes from somewhere, a fact that supply-side thinkers conveniently overlook. I call the more balanced practice of supply- *and* demand-side thinking, ‘second-generation KM.’⁴ (See Figure 1)

Given the prevalence of Taylorism, even in recent times, it should come as no surprise to anyone that knowledge management initially took the supply-side form that it did. Classical economics encourages us to objectify knowledge as if it were something that can be captured, codified, and distributed in discrete form. The ‘suppliers’ in these schemes are, of course, managers who are presumed to possess the wisdom needed to determine *who* should have *what* knowledge, and *when*. This is the inspiration that lies behind the predominant mantra in first-generation KM: *it’s all about getting the right information to the right people at the right time*. The unspoken assumption, therefore, is that *the ‘right information’ already exists*.

Demand-side thinkers, on the other hand, have stopped to question where existing knowledge comes from in the first place, and how it is that some firms manage to have more of it than others? How is it, in fact, that some firms seem more capable of engaging in effective organizational learning such that they adapt faster than their competitors and are more nimble in the marketplace? In other words, how do firms innovate?

I have been fortunate to count myself among those of a small group of demand-side thinkers who have been wrestling with the question of organizational knowledge production. This group, the Knowledge Management Consortium International (KMCI)⁵, is a non-profit professional association that has declared its commitment to systems thinking as the foundation for practice in KM. As a result, the KMCI has become the de facto center of thought for second-generation KM theory and practice. Moreover, in a reference to its views on complexity theory, the KMCI was described last year by *Knowledge Management* magazine as, “the Santa Fe Institute for knowledge management.”⁶ Indeed, the KMCI’s formulation of second-generation KM is worth noting because it signals the particular influence of systems thinking on a management domain of great contemporary importance: *organizational learning and business innovation*.

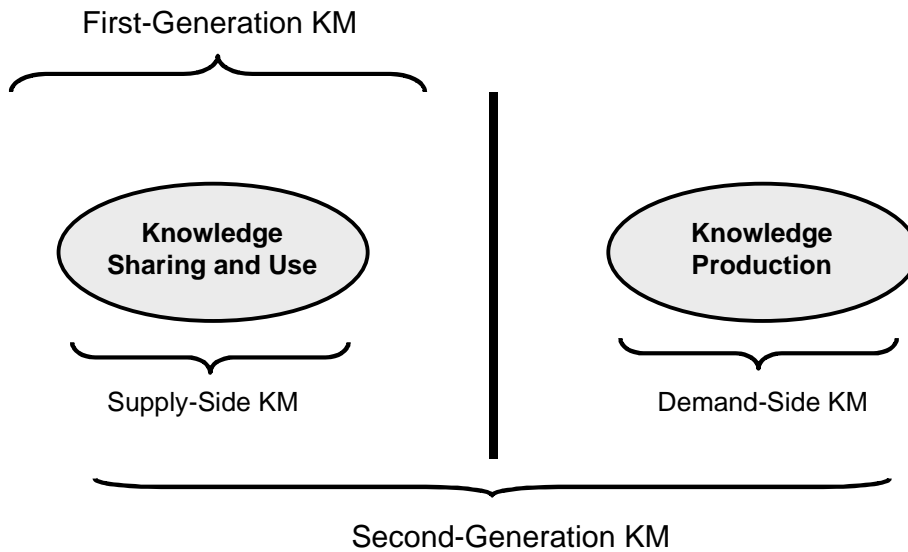


Figure 1 - The Two Sides of Knowledge Management

Framing the Debate

Earlier this year, the *Wall Street Journal* ran a front-page article entitled, ‘*Self-Organization: The Next Big Thing?*’⁷. Therein appeared the following claims: “Today, self-organization is rapidly becoming a very hot idea, the essence of which is that top-down master plans aren’t the only way to build something big and lasting. Unorganized assemblies of people can create everything from marketplaces to computer systems almost spontaneously, on the fly, from the bottom up.” In other words, creativity in human social systems often flourishes despite the absence of centralized planning or control. From this perspective innovation is seen as an emergent social process, not an administrative one.

The KMCI’s study of competing theories on how innovation ‘happens’ in human social systems quickly revealed the predominance of two distinct schools of thought. The first camp, the *reductionists*, view innovation as an administrative function managed by hierarchies. This approach to organizational innovation includes techniques designed for organizational use, such as the so-called ‘stage-gate’ method, now commonly employed by mainstream R&D shops. Also featured in the reductionist school are techniques designed for individual use such as the TRIZ⁸ method, which looks to conceptual patterns found in prior inventions for inspiration in the development of new ones. The reductionist camp invariably views the challenge of innovation as an utterly top-down, manageable affair. Even a cursory look at the manner in which product innovation is organized and carried out in most firms offers ample evidence of the reductionist perspective at work. Its days, however, are arguably numbered.

The other prevailing school of thought in the innovation debate is the *adaptive systems* crowd – myself included. We begin by recognizing the fact that the current corporate form of business is a relatively new institution (only about a century old). Further, human social systems – indeed humanity, itself – have been producing new knowledge at impressive rates for *millennia*, now, and have been doing so without the benefit of the

kind of centralized planning and control schemes so prevalent in today's mainstream corporations.

According to the adaptive systems camp, human social systems survive by continuously adjusting, or *fitting*, themselves to their environments, which they do by engaging in real-time, non-stop learning. In fact, adaptive systems theory holds that innovations are the product of *social systems*, not individuals. While individuals certainly invent, only whole social systems can innovate, because innovation involves widespread deployment of validated new knowledge into social practice. And there can be no widespread deployment of new knowledge into practice until, and unless, widespread *acceptance* of such knowledge has first occurred. This is a social proposition, not an individual one.

The reductionist side of the debate is unquestionably treading on thin ice right now. In discussing the so-called "problem of [modern corporate] innovation," authors William Miller and Langdon Morris, *Fourth Generation R&D*, put it this way: "Although commonly denied in public, it ['the problem of innovation'] is discussed at length and deeply lamented in private, where top managers know that their corporations are failing at innovation and particularly at making the substantial leaps that are required for discontinuous innovation."⁹ They later add, "It is clear that there is a serious problem with the practice of innovation, and it would not be an exaggeration to say that most corporations are pushing a rope at it without success."¹⁰ The title of the chapter in which these statements appear is, *Innovation In Crisis*.

The adaptive systems side of the debate sees the crisis of innovation as the result of a failure to recognize the fundamental nature of human organizations. Instead of turning to such reductionist stalwarts as Frederick Taylor for inspiration, the systems thinking camp has turned, instead, to the natural sciences for an understanding of how cognition happens in living systems. Perhaps their richest source of insight has been the science of complexity, which is more a branch of mathematics than a science, per se. Complexity science focuses on the study of orderly behavior in what are otherwise decidedly *disorderly* systems. Of particular interest to some complexity scientists is the ontology

of knowledge in living systems. The theory of how knowledge unfolds in such systems – according to complexity science – is known as *complex adaptive systems theory* (CAS theory). CAS theory is the special province of the Santa Fe Institute in New Mexico.

CAS theory, for the second-generation, systems thinking side of the KM industry, has emerged as the most respected, most credible model for representing the complex dynamics of knowledge-making and practice in human social systems. But to many of us involved in both the KM and OL communities, it's not clear that CAS theory's relevance to management or to the conduct of human affairs is yet fully appreciated – much less understood – by constituents of either group. From here, then, I will try to explain what, to me, is the most profound implication of CAS theory as applied to organizational learning and business innovation.

Complexity Theory and OL

In the past, I have been mildly critical of the organizational learning (OL) community's failure to embrace complexity theory as a preferable basis for describing and modeling the dynamics of social learning and innovation. Since I am a card-carrying member of that community, I see myself as no less responsible than others for this, a charge I now mean to confront by revealing the compelling facts of my own discoveries in this area. What I have to offer, then, is a fresh perspective on the ontogeny of knowledge in human social systems, and a means by which related insights can be parlayed into useful practice for the improvement of organizational learning and performance.

CAS theory can be summarized as follows: *living systems continuously fit themselves to their environments by determining how well competing strategies for survival work for them in practice*. In other words, they learn. They have the capacity to detect conditions in their environments and to further formulate coping strategies for themselves, in response. Once experienced in the form of practice, the relative merits of different strategies are then assessed, after which they are either repeated, discarded, or modified for further use, depending on the kind of feedback received by the system. The 'systems'

in this case are living systems, which in a human context can either be individual humans or whole social systems. Families, communities, nations, societies, organizations, businesses, clubs, churches and professional associations are all CASes operating at different levels of scale. (See Figure 2)

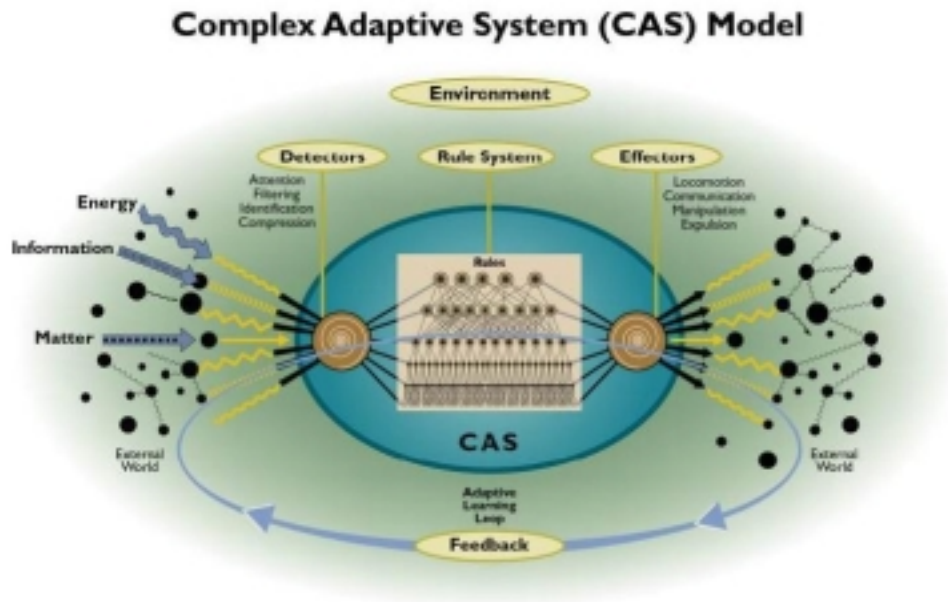


Figure 2 - Complexity Theory's Complex Adaptive Systems (CAS) Model

Source: Idiagram - Lincoln, MA (www.idiagram.com)

Of particular additional interest in human social systems is their capacity to engage in learning-like behaviors *in the aggregate* as though social systems, themselves, are conscious living beings. And in some respects they are, but rather than say that 'organizations learn,' as we so often do in the OL community, CAS theorists hold, instead, that individuals operating in groups routinely engage in *mutual learning*, not *collective learning*. This, when viewed from afar, conveys the impression that social systems, themselves, are somehow learning. This is an illusion. Moreover, its presence may account for why so many managers have failed to fully embrace the OL movement: there's simply no 'there' there to grab onto. Organizations don't learn, people do –

individually, mutually, and cooperatively. People are then prone to act in unison in accordance with their mutually-held shared knowledge, thereby giving the impression to outside observers that their collective form has somehow engaged in learning, itself. But it hasn't. There is no learner there to learn; only multiple individuals who sometimes learn together.

By pointing to the illusory nature of these dynamics, I in no way mean to disparage or discredit the importance or legitimacy of organizational learning to management, or to the conduct of human affairs. Rather, I believe that CAS theory when applied to OL only adds clarity and substance to what for many of us has been an intuitively compelling idea. Despite its appeal, however, OL has been criticized by some as lacking executability. If organizations learn, they have asked, what are the specific dynamics by which they do so, and how can we engage them to ensure their success? Where OL theory has left off, then, CAS theory has picked up. In their combined form, the elegance and the simplicity of the vision they together evoke is disarming. And so here it is.

The 'Learning Drive'

As every student of organizational learning knows, all knowledge – shared or otherwise – begins in the minds of individuals. Individual learning is, therefore, necessarily antecedent to mutual, or organizational, learning. But it takes more than individual learning to get things started. It takes *independent* individual learning. There's a big difference between learning about things *I* want to know because of *my* interests, versus learning about things I'm required *by others* to know. Here I point to the difference between learning and training. Learning in its purest form is a voluntary, self-directed act that follows from intrinsic motivation. Training is something we endure in response to other people's views on what *they think* we should know (extrinsic motivation).

In human social systems, people who learn and who hold knowledge about things that interest them deeply and personally tend to co-attract one another on the basis of their shared interests. This is not a managed process; rather, it's a natural one in the sense that

its occurrence is self-organizing and emergent. No one forced me to join the Society for Organizational Learning. I did it voluntarily because of my desire to interact with kindred spirits of a like-minded sort, who apparently share my passions and interests about the mysteries of learning. This is how communities form. Real communities, if you will, are self-organizing in origin. You don't legislate communities; they spring forth from the mutual desires of independently operating individuals to affiliate with one another on the basis of their shared interests.

Once formed, communities then act as the developmental breeding ground for new ideas, new knowledge, and potential innovations. Inside communities, we share our individual ideas and subject them to group review, as even now I am doing in the production and publication of this paper. Through dialogue and discussion in group contexts, ideas hatched in the minds of individuals become exposed to those of others, and are gradually refined, expanded, and integrated into forms that meet with group, or community, approval. Many ideas, as well, are invalidated and are discarded in favor of more credible ones. In these ways, ideas born in the minds of individuals are subjected in communities to scrutiny and validation. Communities, therefore, are of fundamental importance to the development of shared organizational knowledge. Without them, knowledge moves too quickly from the minds of individuals into the realm of organizational practice, a leap that undoubtedly accounts for the demise of authoritarian and dictatorship regimes throughout history. There's simply no denying the value of knowledge validation as performed by healthy and diverse communities in human social systems.

Just as people tend to collaborate and compete with one another for validation and acceptance of their ideas in communities, so do communities, themselves, collaborate and compete with each other for validation in the communities *of* communities we call organizations. The same principles that apply *within* communities are at work *between* them, as well. The influence of adaptive system dynamics merely shifts in scale: from the individual to the community; to the community *of* communities, and so on. Even in the most rigidly managed command-and-control style organizations, ideas begin in the

minds of individuals, migrate into communities, and therein vie for favor and acceptance in the struggle for organizational adoption. In strict hierarchical regimes, there are simply fewer opportunities for individuals to participate in self-organized communities, and fewer communities to draw from in sourcing organizational knowledge. The adaptive capacity of organizations operating under such conditions suffers, accordingly.

Now, here's the jaw-dropping insight gleaned from years of study by complexity scientists poring over the research on how knowledge happens in living systems. Their conclusions? It self-organizes! And the form it takes as it does so expresses itself in precisely the same pattern of social processes I have sketched out above. Here it is again in succinct form: *independent individual learning, followed by the formation of self-organized communities, followed by organizational adoption.* (See Figure 3) That's the endogenous pattern of knowledge making found in all human social systems, and the beauty of it is that it's utterly emergent, self-organized, self-propelled, and completely devoid of the Promethean hand of management – what complexity scientist Stuart Kauffman calls, “order for free.”¹¹

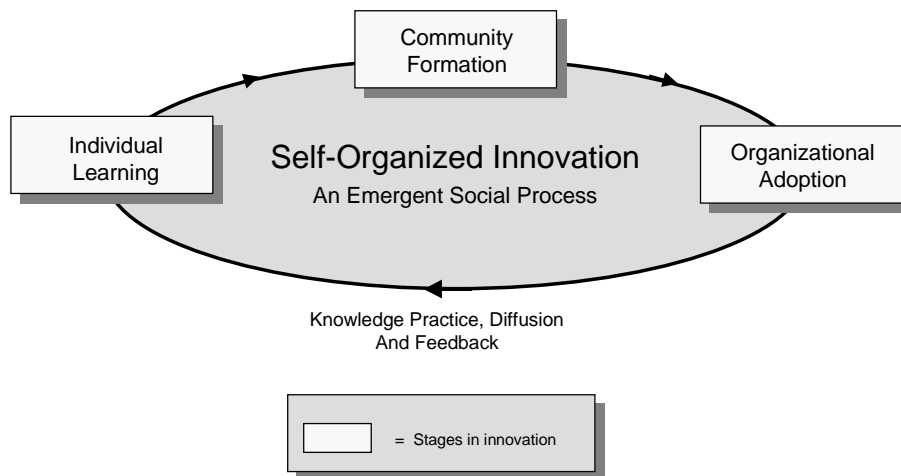


Figure 3 - Self-Organized Social Pattern of Organizational Learning and Innovation

Burn that pattern indelibly into your mind's eye and then re-read Thomas Kuhn's *Structure of Scientific Revolutions*¹². What you'll see is that Kuhn repeatedly invokes the same pattern as he skips across the centuries in his evolutionary account of scientific knowledge. First, the obvious role of *independent individual learning* by such luminaries as Galileo, Newton, Copernicus, Einstein and many others looms large. Next, and just as conspicuous, are the many *self-organized communities* prominently featured within the revolutionary 'structure' that Kuhn spoke of. In his own words, "Communities of this sort are the units that this book has presented as the producers and validators of scientific knowledge."¹³ And finally, in a separate reference to what I refer to as *organizational adoption* – the culmination of the competition between communities for standing – Kuhn wrote, "Competition between segments of the scientific community is the only historical process that ever actually results in the rejection of one previously accepted theory or in the adoption of another."¹⁴

These are very strong words, which on the basis of Kuhn's study of the manner in which scientific knowledge has evolved over the centuries, testifies to the irrepressible nature of self-organized knowledge-making processes in social systems. This pattern – *independent individual learning, followed by the formation of self-organized communities, followed by organizational adoption* – is undeniably at work under its own steam in human social systems at all levels of scale. It is as naturally present in the social milieu of organizational life as the sex drive is for individuals in the propagation of species. In this case, however, we're talking about the existence and influence of a *learning drive* and its role in the propagation of knowledge. Both are self-organized in their ontogeny, and both are undeniably at play in the affairs of human social systems.

That the learning drive exists, and that it expresses itself in the characteristic pattern I have described, are claims that I and others have made and which practically support themselves now on the basis of prima facie evidence alone. Once understood, the pattern can be seen everywhere in practice, expressing itself through self-organized means, usually in the complete absence of interfering management schemes. A full appreciation of this phenomenon requires not only an understanding of organizational learning theory,

but also a competent grasp of the role that complexity science has played in modeling the evolution of knowledge in adaptive systems. Think of it this way: the organizational learning movement now has a more granular operating model to work with; one which offers a more detailed description of the dynamics of *mutual learning* in human social systems. Armed with such a plausible model of *how* learning happens in human social systems, practitioners now have something sufficiently tangible to work with – something they can see, touch, and feel as a concrete basis for action.

A Framework For Action

Unlike the reductionist approach to managing anything, systems thinkers – and now the CAS-inspired OL crowd – understand that the behavior of complex systems can be traced to their structures. Thomas Kuhn knew this, and now we know this. What I have described above, then, is the *structure of learning* – knowledge production and innovation, if you will – in human social systems. Listen to it again: *independent individual learning, followed by the formation of self-organized communities, followed by organizational adoption*. Individuals engage in self-directed learning. They then co-attract one another and collectively form communities of knowledge. Mutually held knowledge is then developed inside these communities and is validated by them as such. Communities then compete with one another in their shared community *of* communities and eventually come to adopt meta-community knowledge (aka, organizational knowledge). When this happens, episodes of organizational learning can be said to have occurred.

But since all of this is self-organizing in its ontogeny, who needs management? You don't order social systems to engage in knowledge-making any more than you command plants to grow; they are both already predisposed to do so without the need for any management at all. But do all organizations learn equally well? Does my firm articulate these processes in the same way yours does? Probably not. In fact, most firms could be accused of actually *inhibiting* these processes, which after countless generations of human evolution unquestionably account for how we got this far. God forbid we should

get out of their way and let these social patterns of learning and innovation fulfill their purpose in the conduct of human affairs: *to help us adapt!* Indeed, you don't manage knowledge, you get out of its way. Better yet, you offer aid and support to its characteristic expression in human social systems. I will now try to explain how.

Reductionist dogma is predicated on the belief that people operating in human social systems can be manipulated and managed into following certain prescribed patterns of behavior. By refining those processes and managing people ever more efficiently, practitioners of reductionist thinking believe they can create human operating systems whose behaviors comply with management designs. This is vintage BPR and first-generation KM thinking. Interesting, but misguided. Reductionist thinking completely overlooks the fact that certain business-related behaviors are already present in human social systems, and simply can't be ignored or wished away. It's the proverbial herding of cats problem. Cats will simply not be herded any more than people operating in human social systems can willfully disavow their tendency towards *independent individual learning, followed by the formation of self-organized communities, followed by organizational adoption*. Any attempt to ignore these patterns or to replace them with artificially prescribed forms of learning and innovation only conflict with them in the long run, and are therefore unsustainable. These patterns will simply not be denied, nor will they conveniently go away.

And why would we want them to? If it's enhanced organizational learning and business innovation we're after, we should embrace these patterns, roll out the red carpet, and grant them the keys to the kingdom. That, then, is the key to enhancing organizational learning and business innovation as inspired by complex adaptive systems theory. Unlike the conventional practice of management in which policies are prescribed in order to deterministically drive certain behaviors, wisdom in the practice of systems thinking suggests precisely the opposite. The policies we embrace, in this case, should be driven by organizational behaviors, not the other way around, because the behaviors of interest already exist. Therefore, on the one hand, we should go out of our way to avoid policies which either conflict with or inhibit the expression of these antecedent behaviors, while

on the other, we should aggressively seek to enact policies that will support, strengthen and reinforce them. In this regard, the controlling orientation of conventional management is wholly inappropriate and self-defeating. What's required, instead, is a deferential approach, not a prescriptive one. Management policies, in this case, should follow from behaviors, not the reverse.

If the pattern of interest is: *independent individual learning, followed by the formation of self-organized communities, followed by organizational adoption*, then the kinds of interventions we should be considering are those that make their full actualization and expression possible. The rest will naturally follow. (See Table 1)

Self-Organizing Behaviors	Supporting Policies
<ul style="list-style-type: none">• Independent Individual Learning	<ul style="list-style-type: none">• Formally support self-directed, self-managed learning programs for all employees
<ul style="list-style-type: none">• Community Formation	<ul style="list-style-type: none">• Embrace policies and programs which enable and support self-organized communities of knowledge
<ul style="list-style-type: none">• Organizational Adoption	<ul style="list-style-type: none">• Formalize the inclusion of community-made knowledge in the politics of organizational knowledge-making

Table 1 - Sample Learning and Innovation Policies

In addition to policy choices directly related to *individual learning, community formation* and *organizational adoption*, high-performing adaptive systems are endowed with certain other basic attributes that point to the need for policies in two additional areas. (See Table 2)

Adaptive Attributes	Supporting Policies
• Diversity	• Adopt recruiting and retention policies which acknowledge the value of diversity in <i>backgrounds, attitudes, and worldviews</i> as comprising a rich source of creativity and innovation within a workforce
• Information Flow	• Adopt 'connectivity' policies to ensure that information produced by, for, and about each component of the organizational learning and innovation process is able to flow freely and effectively throughout the organization

Table 2 - Adaptive Attributes and Sample Policies

The policy recommendations shown in Table 2 come directly from the ‘complexity’ literature on complex adaptive systems. Of particular interest is the work of John Holland, professor at University of Michigan and a principal player in the early development of CAS theory at the Santa Fe Institute. According to Holland, the proper functioning of adaptive systems depends on “extensive interactions, the aggregation of diverse elements, and adaptation or learning.”¹⁵ On the meaning of the term ‘adaptation,’ Holland explains, “Adaptation, in biological usage, is the process whereby an organism fits itself to its environment. Here, we expand the term’s range to include learning and related processes.”¹⁶

To help simplify the matter of policy determination, I have found it useful to think in terms of the following definitive framework, which practitioners can use as a normative guide in formulating potential policy interventions:

1. ‘Embryological’ Policies – This category of knowledge- and learning-related policies embodies policy decisions in two areas closely related to the formation of new knowledge in human social systems: individual learning and community formation. Policies that ensure opportunities for self-directed learning by individuals, and which also make it possible for communities of knowledge to self-organize and receive support for their activities are important here. Policies adopted in this category therefore relate to the first two components of the self-organized pattern of knowledge making (*individual learning* and *community development*). They have their intended effects by determining the extent to which individuals in an organization can, in fact, engage in self-directed learning, and the extent to which conditions either inhibit or support community formation in a firm.
2. ‘Politics’ of Knowledge Policies – This category deals with the manner in which new knowledge is produced, diffused and practiced in an organization. For the most part it deals with who gets to participate in related deliberations, hence the political spin to its title. This category also involves policies related to knowledge entitlement, thereby incorporating corporate positions on such matters as intellectual property ownership and sharing. Policies adopted in this category determine the extent to which knowledge hatched by individuals and developed in communities can fairly compete for *organizational adoption* with the authority structures already in power in a firm. Whereas most firms tend to practice oligarchically oriented politics in this space, highly adaptive organizations tend to be more open and democratic in their treatment of dissident views.
3. Diversity – Unlike most diversity programs in business, this category of knowledge-related policies has less to do with *ethnic* diversity than it does with *ethos* diversity, or *ethodiversity*¹⁷. As such its primary focus of interest is in the realm of policies which deal with managing the ethos demography, or *ethography*¹⁸, of a firm. Of particular interest here are policies which influence recruiting, hiring and retention practices and the effects they have on the mix of worldviews, attitudes and outlooks embodied within a firm. This is all about achieving a healthy mix of intellectual diversity by populating organizations with individuals who hold widely divergent philosophies and worldviews, as opposed to staffing an organization with people who all think

- alike. Again, this is *ethodiversity*, not ethnic diversity. Affirmative steps can be taken in this area but only if the right policies and tools are in place to support them.
4. Connectivity – This last category deals with the extent to which information can flow throughout the organization in support of *individual learning*, *community formation* and *organizational adoption*. Technology certainly plays a role here, but so do unspoken rules embedded in the culture of a firm, which very often conspire to inhibit free and open communication between people and groups. To the extent that these conditions inhibit the flow of information between people, communities, and authority structures, they frustrate, in turn, the emergence of self-organized patterns of learning and innovation in human social systems. Here again, affirmative steps can and should be taken to ensure that knowledge and information moves appropriately within the organization, or between it and others, as needed.

By synchronizing policies in each of the four areas described above with the known complexion of self-organized knowledge processes in human social systems, managers can willfully enhance both the rate and quality of learning and innovation in a firm. (See Figure 4)

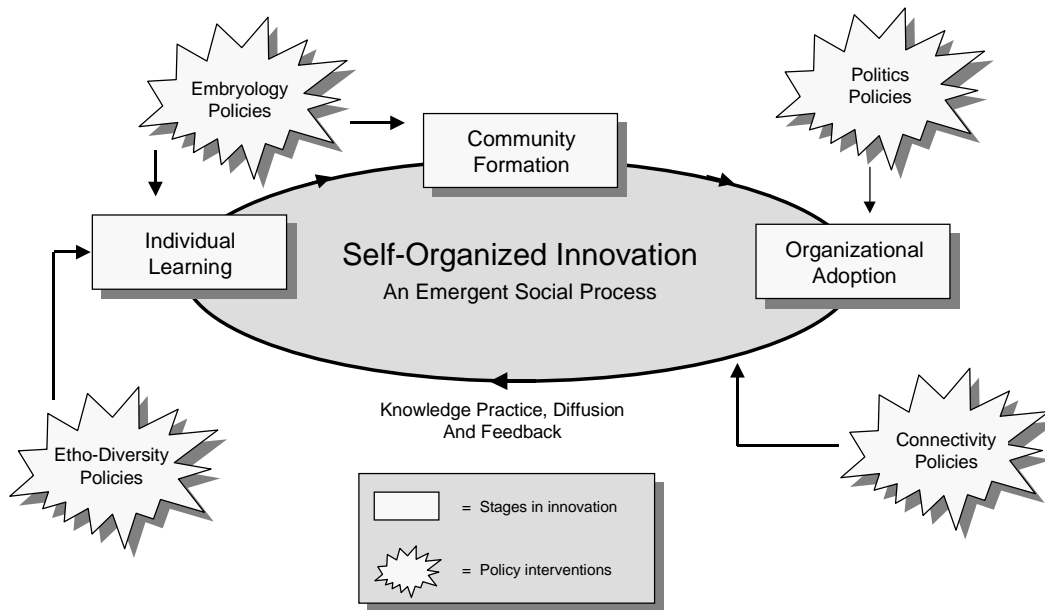


Figure 4 - The Policy Synchronization Method (PSM)

It is because of this deliberate intent to synchronize policies with the emergent nature of knowledge-making in human social systems that I call the methodology described here, the *policy synchronization method*¹⁹. As such, it is the only method I know of that, 1) predicates its interventions on the assertion that people in organizations tend to self-organize around the production, diffusion and practice of mutually-held knowledge, and 2) claims that the most effective approach to improving organizational learning and innovation is one which affirmatively – and *deferentially* – embraces policies designed to strengthen and reinforce such endogenous behaviors.

Conclusion

Complexity science has made it possible to ‘see’ patterns of social processes involved in the production, diffusion and practice of organizational knowledge. This pattern is algorithmic in the sense that it manifests itself in a regular form, both within and across human social systems at multiple levels of scale, in the following way: *independent individual learning, followed by the formation of self-organized communities, followed by organizational adoption*. By all accounts, this pattern of behavior has been deeply involved in the evolution of human knowledge since time immemorial and is, itself, a product of evolution.

Managers in business who wish to improve their firms’ performance in learning and innovation would do well to begin by recognizing the fact that human social systems are already endowed with self-organized patterns of related behaviors. Management in this arena, then, has a great deal less to do with the design of *new* business processes than it does with the support, strengthening and reinforcement of *existing* ones. This can be achieved using a *policy synchronization method*, which advocates the adoption of organizational policies and programs in four critical areas: 1. Embryological Policies (individual learning and community formation), 2. Politics of Knowledge Policies (governance of knowledge production, diffusion, practice and entitlement), 3. Diversity Policies (the distribution of worldviews or belief systems in a firm; ethos diversity, or

ethodiversity), and 4. Connectivity Policies (the proper flow of information and knowledge throughout an organization).

The use of the *policy synchronization method (PSM)* for improving organizational learning and innovation offers the following key benefits:

1. Administrative and cultural barriers to individual and organizational learning are systematically broken down by focusing on related policies and programs in the four areas encompassed by the method. Both the rate and quality of adaptive learning and organizational innovation improve under such conditions.
2. The tendency of people and groups in organizations to self-organize around their own passions and interests is supported and strengthened by embracing knowledge-related policies and programs which encourage and reinforce related behaviors. Peoples' best efforts and ideas thereby become more prolific, higher in quality, and more accessible to the organization as a whole.
3. The PSM method turns learning and knowledge-making into a distributed enterprise-wide affair by formally embracing the learning and innovation interests of individuals and communities in all precincts. As a result, the creativity of *whole social systems*, not just their administratively anointed management teams, can be tapped for competitive and adaptive advantage. While the vast majority of most firms' populations are effectively marginalized by overly-centralized, formal innovation programs, under the PSM method the totality of an organization's stakeholders become fully engaged in learning and knowledge production.
4. Because the policies advocated under a PSM approach are explicitly synchronized with endogenous patterns of self-organized learning and innovation in human social systems, the rate and quality of organizational learning and innovation not only improve, but *remain* improved at sustainable levels. This leads to the notion of *sustainable innovation*²⁰. Knowledge-related policies that are *not* synchronized with self-organized patterns of learning and innovation in human social systems inevitably conflict with those patterns, and are eventually undermined *by* them. Artificial programs of this kind are therefore unsustainable. In contrast, policies and programs

designed to explicitly support those patterns become locked in embrace *with* them in a mutually-reinforcing dance of self-sustaining innovation. In the jargon of system dynamics, this is known as a ‘virtuous reinforcing cycle.’ (See Figure 5) Organizational learning and innovation flourish under such conditions.

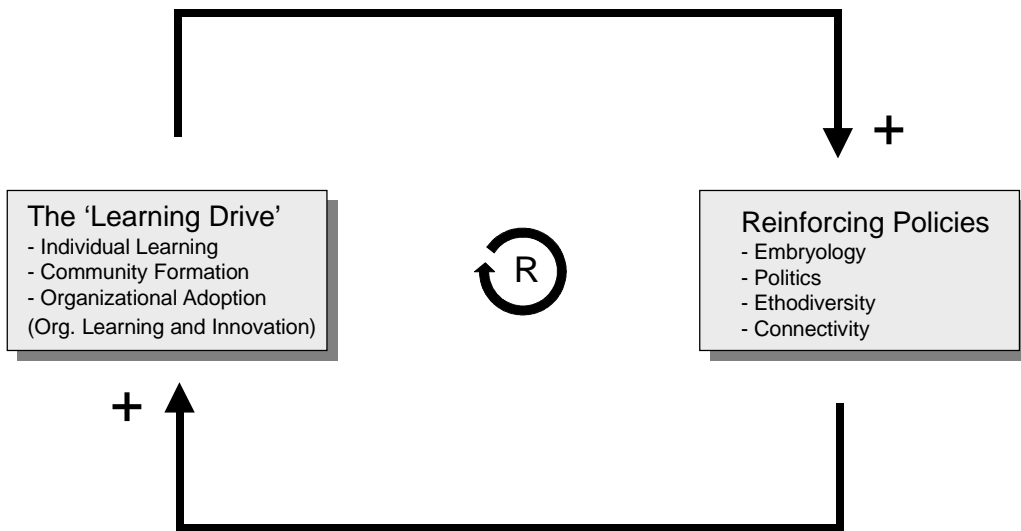


Figure 5 - The ‘Learning Drive’ In a Virtuous Reinforcing Loop

5. The PSM method is bottom-up, not top-down, in its orientation. It explicitly disavows the contention that people operating in a social milieu can be manipulated by prescriptive management edicts, which seek only to command and control them at the expense of their independence and initiative. By embracing the distributed learning capacity of whole social systems, the PSM method marks a radical departure from classical management dogma, according to which only a minority of a firm’s individuals are seen as capable of engaging in worthwhile learning and innovation.

Strong anecdotal evidence exists in support of the kinds of policy interventions advocated by the PSM method. The so-called ‘fifteen-percent rule’ at 3M, according to which employees there can spend up to fifteen-percent of their time engaged in self-determined, self-managed *independent individual learning*, is widely seen as a major factor in what accounts for that company’s industry-leading levels of innovation. Elsewhere, at Deere and Company in Moline, IL, management there has been working for more than a year on the deployment of policies, programs and infrastructures aimed at encouraging and supporting *self-organized communities* of practice. As in the case of 3M, Deere is also taking steps to alter the politics of knowledge there, so that community-made knowledge can play a more formal role in decision-making and the development of business strategy as promising new ideas rise to the fore.

While these and other examples offer strong testimony to the effects that pieces and parts of the PSM method can have on organizational learning and innovation, I know of no firms that have taken the whole step of transforming policies in all four areas. This, to me, represents a significant opportunity for practitioners involved in learning, knowledge, and innovation management, who may all ‘get’ the vision thing but lack concrete steps for *how to get there from here*. By focusing on the development and implementation of specific knowledge-related policies and programs in each of the four areas described above, the rate and quality of organizational learning and innovation can be markedly improved on a sustainable basis. Remember the pattern: *independent individual learning, followed by the formation of self-organized communities, followed by organizational adoption*. Nurture the ‘learning drive,’ and sustainable innovation will follow.

Notes and References:

1. Data from Value Line Publishing, Inc.
2. McElroy, M. (1999), “The Second-Generation of Knowledge Management,” *Knowledge Management Magazine*, October, pp. 86-88.
3. Ibid.
4. Ibid.

5. The Knowledge Management Consortium International's website is www.kmci.org
6. Mantelman, Lee (1999), *Knowledge Management Magazine*.
7. Wysocki, B., Jr. (2000), "Self-Organization: The Next Big Thing?", *Wall Street Journal*, July 10, p. 1.
8. The TRIZ method (pronounced "trees") is an invention production technique created by a Russian patent-office worker, Henry Altshuller, in the former Soviet Union in 1947. TRIZ is a Russian acronym that stems from a phrase pertaining to the solution of inventive problems.
9. Miller, W. and Morris, L. (1999), *Fourth Generation R&D*, John Wiley and Sons, New York, NY, p. ix.
10. Ibid, p. x.
11. Kauffman, S. (1995), *At Home in the Universe*, Oxford University Press, New York, NY, Chapter 4.
12. Kuhn, T. (1962), *The Structure of Scientific Revolutions*, University of Chicago Press, Chicago, IL.
13. Ibid, p. 178.
14. Ibid, p. 8.
15. Holland, J. (1995), *Hidden Order, How Adaptation Builds Complexity*, Perseus Books, Reading, MA, p. 4.
16. Ibid, p. 9.
17. *Ethodiversity* is a term I invented. It's a reference *not* to the ethnic diversity of an organization, but to its ethos diversity. I define this as *the distribution of underlying sentiments, dominant assumptions, worldviews, philosophies, politics, attitudes, and predispositions that inform the beliefs, customs, or practices of individuals in an organization*.
18. *Ethography* is also I term I invented. It refers to the discipline of detecting, recording and analyzing the ethodiversity of an organization. Further, the representation of an organization's ethography comprises its *ethographics*.
19. The 'policy synchronization method' is the subject of a U.S. patent application filed with the Patent and Trademark Office in September, 2000 by Macroinnovation

Associates, LLC of Windsor, VT (www.macroinnovation.com). It currently holds patent-pending status, accordingly.

20. McElroy, M. (2000), “The Principle of Sustainable Innovation,” Posted at the following Internet URL: <http://www.macroinnovation.com/images/Principleof.pdf>

About The Author

Mark W. McElroy is the founder and president of Macroinnovation Associates, LLC, an innovation methodology shop located in Windsor, Vermont. Macroinnovation Associates is the developer of the Macroinnovation™ Method, a patent-pending technique for improving business innovation based on principles taken from organizational learning and complexity theory. Prior to forming his company, Mr. McElroy held such positions as Partner at KPMG Peat Marwick, Senior Manager at Price Waterhouse, and Principal at IBM’s Knowledge Management Consulting practice in Cambridge, MA. In all, he has 23-years’ experience as a management consultant.

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