Discovering Complexity

A Story of an Organization in Crisis and its Response

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No one likes a crisis but often it seems to take one before people and organizations change. Armies are reformed only after defeats; safety regulations are introduced after accidents; cathedrals are restored after they burn and firms only change strategies after significant reversals.

Indeed the role of crisis in change is widely recognized, but poorly understood. Some have even argued that to a considerable and largely unacknowledged extent, society and its component organizations advance strategically by accident, economically by windfall, and politically by disaster. This does not mean that results are random: chance still favors the prepared mind. But our minds need to be prepared for uncertainty and turbulent times in a complex, nonlinear world. One way to do this is to use ecological models and organic metaphors to make sense of events. Those who rely on linear models and mechanical metaphors risk being blindsided by sudden change.

This story has two objectives. The first is to tell my tale of an organization thrown into crisis and how we discovered some complexity management practices that allowed us not only to survive but to thrive. The second objective is to outline an ecological model of organizations and to commend it to the readers as extremely useful for understanding complexity science[1] and transformation and change in complex adaptive systems. I begin with the

[1] Complexity science is the study of the behavior that emerges from the interaction of multiple, interdependent objects and agents. It often begins with the study of systems that exhibit complex behavior, like ecosystems and economies. Complexity science can be seen as a grand, sense-making narrative that embraces multiple perspectives, using concepts and tools from many disciplines. Thus, it is not a unitary science with 'principles' that can be 'applied'. It should be thought of as a portfolio of frames and metaphors to be 'activated' in the minds of inquirers. These will include both analytic methods familiar in the natural sciences as well as the analogical modes of inquiry found in the humanities.

discovery of complexity by my colleagues and myself during a tumultuous time and my subsequent attempts to make sense of what had happened to us and why.

The Way We Were[2]

When I joined Hugh Russel Inc. in 1979, it was a medium-sized Canadian distributor of steel and industrial products. It had sales of over $500 million and 3,000 employees. The chairman, Archie Russel, who owned 16% of the common shares, controlled the business, which comprised four groups – the core steel distribution business, industrial bearings and valve distribution, a chain of hardware wholesalers, and a small manufacturing business.

The family had run the business for many years but, after going public in the early 1960s, Archie Russel had augmented his management team with the addition of Peter Foster, an aeronautical engineer and Harvard Business School graduate. Foster had spent fifteen years at Procter & Gamble before running a small conglomerate. It was he who had spearheaded the company's diversification into the distribution of industrial products other than steel via extensive acquisitions.

The company was structured for financial performance. The management was professional, with each of the divisional hierarchies reporting to a group president who reported to Peter Foster in his capacity as President of the corporation. Jobs were described in job descriptions, and the way to do them was specified in detailed standard operating procedures. Three volumes of

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[2] The story of Hugh Russel is taken from Chapter 3 of my book, *Crisis & Renewal: Meeting the Challenge of Organizational Change*, Harvard Business School Press, 1995, 2002

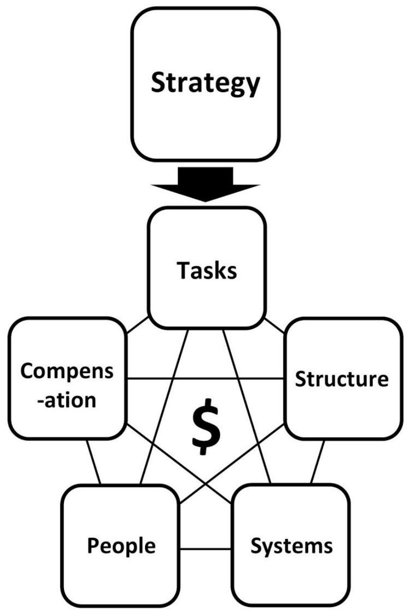
corporate manuals spelled out the policy on everything from accounting to vacation pay. Extensive accounting and data-processing systems allowed managers to track the progress of individual operations against budgets and plans. Compensation for managers was performance-based, with return on net assets (RONA) as the primary measure, and large bonuses (up to 100% of base salaries) for managers who made their targets.

At the senior management levels the culture was polite but formal. The board of directors consisted of Archie's friends and associates together with management insiders. Archie and Peter ran the company as if they were majority shareholders. Their interaction with management outside of head office was restricted to the occasional field trip. The head office was the site for the annual five-year planning exercise and the budgeting process, during which financial targets were negotiated with the divisions, the groups and the corporate office. The emphasis at these meetings was on performance and growth. The five-year plans had to be formulated within a strategic framework that showed growth opportunities, priorities and action plans for their achievement. Notwithstanding the espoused rationality of the process, the planning and budgeting sessions were highly stressful events for all concerned. The corporate office tried to set "stretch targets," raising the profits and sales numbers to which divisional managers "committed," whereas the managers tried to lower these quantities to get numbers that they could live with.

The growth prospects for most of the divisions were modest – these were mature industries with significant competition. To achieve their growth targets senior managers engaged in a vigorous acquisition program. The idea was to fold new operations into the existing ones and so achieve economies of scale and enhanced financial results.

A Mental Model

A typical model from the era captures how managers thought the whole process worked[3]. Not only does it give insights into the corporate culture, it will help frame the ongoing story:



J.R. Galbraith, Organization Design (Reading, Mass.: Addison-Wesley, 1977)

Everything started with formal strategy, which was assumed to be created at the top of the organization, typically by the CEO who, from his (it was almost always 'he') high vantage point, was thought to 'scan the horizon' for opportunities. Once formulated, the strategy was then handed down to people lower in the organization to be implemented. The mantra was that 'structure follows strategy', so once the strategy was determined, tasks, structure, systems, the people needed and their compensation all followed. But strategy was pre-eminent: after that it was all about execution. Variations on this top-down

[3] Galbraith J.R., 1977 *Organization Design*. Reading, Mass.: Addison-Wesley.

view of the world are still popular today. Indeed strategizing has become an existential term that describes Chief Executive Officers' reason for being.

Crisis

Nine months after I joined the company as a financial planner, we were put "in play" by a corporate raider and, after a fierce bidding war, were acquired in a hostile takeover. Our acquirer was a private company controlled by the eldest son of an entrepreneur of legendary wealth and ability, so we had no inkling at the time of the roller-coaster ride that lay ahead of us. We were unaware that not only did the son not have the support of his father in this venture but he had also neglected to consult his two brothers who, together with him, were joint owners of the acquiring company! As he had taken on $300 million of debt to do the deal, this left each of the brothers on the hook for a personal guarantee of $ 100 million. They were not amused and it showed!

Within days of the deal, we were inundated by waves of consultants, lawyers, and accountants: each shareholder seemed to have his or her own panel of advisers. After six weeks of intensive analysis it was clear that far too much had been paid for us and that the transaction was vastly overleveraged, with too much bank debt. At the start of the deal the acquirer had approached our bankers and asked them if they wanted a "piece of the action." Concerned at the possible loss of our banking business, and eager to be associated with such a prominent family, our bankers agreed to provide the initial financing on a handshake. Now, as they saw the detailed numbers for the first time, and became aware of the dissent in the family, they withdrew their support and demanded their money back. We needed to refinance $300 million of debt – fast.

The good news was that, as far as management was concerned, we seemed to be "it." The acquiring business had been run in autocratic style, with seven hundred people apparently reporting to one man! We might be fired individually, but at least the acquirer did not have a management team waiting in the wings. That was the only good news, for interest rates continued to rise, and shortly after the takeover the Canadian economy fell into a deep recession.

Change

The takeover and subsequent merger of our new owners' moribund steel-fabricating operations into Hugh Russel changed our agenda completely. We had new shareholders (who fought with each other constantly), new bankers, and new businesses in an environment of soaring interest rates and plummeting demand for our products and services. Almost overnight the corporation went from a growth-oriented, acquisitive, earnings-driven operation to a cash-starved cripple, desperate to survive. Closures, layoffs, downsizing, delayering, asset sales and "rationalization" became our priorities.

Each of the elements of our organization changed: tasks became roles, structure became teams, systems became networks, compensation became recognition as people changed. They changed from being instruments of a corporate purpose to being ends-in-themselves. This is how it happened:

Task Became Roles

At the head office the clarity of jobs vanished. For example, I had been hired to do financial forecasting and raise capital in the equity markets, but with the company a financial basket case, this clearly could not be done. For all of us the future looked dangerous as bankruptcy, both personal and corporate loomed ahead.

And so it was in an atmosphere of crisis that Wayne Mang, the new President (Archie Russel and Peter Foster left the organization soon after the deal), gathered the first group of managers together to discuss the situation. Wayne Mang had been in the steel business for many years and was trusted and respected by the Hugh Russel people. An accountant by training, he used to call himself the "personnel manager" to underscore his belief in both the ability of people to make a difference in the organization and the responsibility of line management to make this happen. The hastily called first meeting consisted of people whom Wayne respected and trusted from all over the organization. They had been selected without regard for their position in the old hierarchy. Getting rid of the old guard and having a trusted leader like Wayne as our new President was a critical contribution to our survival.

The content and style of that first meeting was a revelation to many - Wayne asked for their help! Few of them had ever been summoned to head office for anything but a haranguing over their budgets – "To have the shit kicked out of us", as they put it. But now they were being told the complete gory details of the company's situation and, for the first time, being treated as if they had something to contribute.

During that first meeting we counted nineteen major issues confronting the corporation. None of them fell into a single functional area. We arranged ourselves into task forces to deal with them. I say "arranged ourselves" because that was the way it seemed to happen. Individuals volunteered without coercion to work on issues in which they were interested or for which they felt their skills were relevant. They also "volunteered" others who were not at the meeting but, it was thought, could help. There was some guidance – each task force had one person from the head office whose function it was to report what was happening back to the center – and some members found themselves on too many task forces, which required that substitutes be found. But that was the extent of the conscious management of the process.

The meeting broke up at 2am when we all went home to tell our incredulous spouses what had happened.

Gradually, as the situation evolved, each of us started to play distinctive roles at these meetings and on the teams. My role became that of facilitator-networker, frame-maker and storyteller: I would develop team agendas, sit in on meetings and frame the process, explaining how I thought the situation was evolving. I became adept at making graphic presentations to bankers, suppliers, and shareholders and dealing with the press.

Every member of the senior team found himself in a new hyphenated occupation. For example, Al Shkut, a gentle giant of a man, excelled at the execution (literally, in many cases) of our plans to close, downsize, and rationalize many operations. He became our organizer-operator-executor. The team would give Al a general direction on an issue, and he would come back with deadlines, responsibilities, and contingency plans all perfectly laid out. He implemented the plans personally and they worked flawlessly.

Wayne was our entrepreneur-negotiator-inspirer. In the 1960s he had had a similar experience with a feuding family in trouble with its bankers, and he knew enough to "expect" the unexpected. On the one hand there were the shareholders and their families, fighting with each other but individually dangerous and likely to combine at any time against outside threat, imagined or real to the family. On the other hand there were the new bankers, with the realization slowly dawning on them that their loans were less than safe. Wayne had a chameleon-like quality that always made you feel that he was on *your* side. I would be at meetings and marvel at his giving what I came to call a "multidimensional" speech. This was a speech in which everyone listening to it – supplier, banker, shareholder – came out with a very different understanding of what was said, but each feeling curiously comforted that his or her interests had been addressed! A rare gift, but it was enormously helpful as we navigated our way through the political minefields trying to build consensus for coordinated action among people and groups who had very different interests and priorities.

The departure of the chairman and his president had shattered the old hierarchy and the formation of all the project teams had blurred the boundaries further. The processes and routines that supported the business activities continued to run, but in the background, freeing us to play roles for which we were best suited. We could be ourselves.

Structure Became Teams

The cross-functional project team rapidly became our preferred method of organizing new initiatives, and at the head office, the old formal structure virtually disappeared. The teams could be formed at a moment's notice to handle a fast-breaking issue and dissolved just as quickly. We found, for example, even when we weren't having formal meetings, we seemed to spend most of the time talking to each other informally. Two people would start a conversation in someone's office, and almost before you knew it, others wandered in and a small group session was going. Later on we called these events "bubbles"[4].

[4] A bubble is a minimalist organization: there is a transparent boundary that separates the inside from the outside, and that's it. Bubbles are temporary, transparent, soft, almost playful structures that cluster together to form easy

Later, when I became executive vice president, Wayne and I deliberately shared an office so we could each hear what the other was doing in real time and create an environment in which "bubbles' might form spontaneously. As people wandered past our open door, we would wave them in to talk; others would wander in after them. The content of these sessions had to do with our predicament, both corporate and personal. It was serious stuff, but the atmosphere was light and open. Our fate was potentially a bad one, but at least it would be shared. All of who were involved then cannot remember ever having laughed so much. It has been said that "humor is shortest distance between two people" and we certainly found that to be the case. We laughed at ourselves and the desperate situation. We laughed at the foolishness of the bankers in having financed such a mess, and we laughed at the antics of the feuding shareholders whose outrageous manners and language we learned to mimic to perfection.

I think it was the atmosphere from these informal sessions that gradually permeated all our interactions – with employees, bankers, suppliers, everyone with whom we came into contact. Certainly we often had tough meetings, filled with tension and threat, but we were always able to 'bootstrap' ourselves back up emotionally at the informal debriefings afterward.

We were amazed at the response of the people on the myriad task forces we had set up. There had been some apprehension at the outset that we would have resignations en masse when people heard about the company's financial condition. Instead, they tackled their projects with a passion we had not seen before, and we lost no one we didn't want to lose. In the old days the strategic plans had been stamped "Confidential," and their circulation restricted. But now

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alliances with each other. In short, they were everything that our old "box" structure was not.

we recognized that this was totally unproductive; the task forces had to know everything. Secrecy is the enemy of trust, and the reaction of our people encouraged us to spread the network of communication even further.

The old divisions had thoroughly distrusted the head office and its obsession with metrics and performance and had kept it at a comfortable distance. These attitudes softened considerably as we walked around soliciting people's views, listening to what they had to say, and incorporating their concerns into our plans. For the first time divisional people felt that they were not just an item on someone else's agenda. The old territorial boundaries began to blur.

The use of informal teams as our primary vehicle for organizing gave us a flexibility that would have been unattainable with the old bureaucracy. People could come together and redeploy at very short notice, and given the broad sharing of information, minimum briefing was required to get everyone up to speed. In addition, people who experienced problems of any kind on one team could easily switch to another. Spread out over the landscape in our issue-driven teams we could rush resources to any one of them and have people up and functioning with the minimum of delay.[5]

Systems became Networks

Our corporation had extensive formal reporting systems to allow the monitoring of operations on a regular basis. After the takeover these systems required substantial modification. For example, we had to track and forecast our cash on

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[5] Alex "Sandy" Pentland, using sociometric instruments to detect non-verbal behavior (body-language), describes the elements of such teamwork as energy, engagement and exploration. See Pentland, A., "The New Science of Building Great Teams", *Harvard Business Review*, April 2012.

a weekly, sometimes daily basis. Each of our different audiences seemed to want information in its own idiosyncratic format, and cash conservation became our single most important priority. But the major change in our use of information was created by our need to address a slew of audiences we had never faced before.

The primary cause of this was the company's preferred shares, which continued to trade on the stock exchange. Although we had tried to buy them back from the holders at the time of the deal, we had not succeeded in getting them all. This meant that we had to report our results to the public every quarter at a time when we were losing nearly two millions dollars a week! We knew that unless we got to our suppliers ahead of time, they could easily panic and refuse us credit. Hasty moves on their part could have fatal consequences for the business.

In addition our closure plans for plants all over Canada and the United States brought us into contact with unions and governments in an entirely different way. We realized that we had no option but to deal with these audiences in advance of events.

The results were astounding. Initially our major suppliers could not understand why we had told them we were in trouble before we had to. We succeeded, however, in framing the situation in a way that enlisted their cooperation in our survival, and by the time the "war story" was news, we had their full support. Similarly, most government and union organizations were so pleased to be involved in the process before announcements were made that they bent over backward to be of assistance. We set up joint task forces with these "outside" agencies to resolve what had become shared problems. A significant contributor to our ability to pull this off was the high quality of our internal communication. Everyone on the teams knew the complete up-to-date picture of what was happening. An outside agency could talk to anyone on the team and get the same story. In this way we constructed a formidable network of contacts, many of whom had special skills and experience in areas that would turn out to be of great help to us in the future.

The addition of multiple networks to our information systems enhanced our ability both to gather and disseminate information as well as to gather suggestions from people often not consulted in the decision-making process. The informality and openness of the networks played a significant role. We had an early warning system with which to detect hurt feelings and possible hostile moves on the part of shareholders, suppliers, nervous bankers, and even customers. The information helped us head off trouble before it happened. The networks also acted as a broadcast system through which we could test plans and actions before announcing them formally. In this way we not only got excellent suggestions for improvement, but everyone felt that he or she had been consulted before action was taken.

People Changed

The most striking feature of the transformation that was taking place inside the corporation was the changing attitude of the people. We found this happening both inside and outside the organization. It was brought home to us when we were out in Winnipeg on the Canadian prairies, reporting our terrible financial results to a mass meeting of all the people in one operation. About 15 minutes after the meeting ended one of the lead hands approached Wayne Mang and said, "Look I've been talking to the boys and we wondered whether it would help if we took at 10 percent reduction in pay?" The offer made no logical sense: the savings were miniscule compared with the sums of money we needed, but it spoke volumes about the commitment the group felt to the company. This small humble group had shown that they cared and the story spread around the organization like wildfire, bolstering the "volunteer" spirit among all employees. The corporation's predicament and our requests for help had evoked a new cooperative atmosphere in the organization. It seemed that we had discovered the existence of unsuspected shared values.

Compensation Became Recognition

The company's formal compensation system for managers had been performance-based, with significant bonuses to be made by hitting budgeted targets. Base salaries were adjusted after formal annual performance reviews. This compensation scheme collapsed very quickly. The recession and rationalization of operation removed any possibility of bonuses. Performance reviews were suspended, and across the company base salaries were frozen and, in some cases, rolled back. Yet the organization did not disintegrate. If anything, morale went up.

The team had discussed the imposition of the freezes and rollbacks with trepidation. The money saved made very little difference to the corporation's ability to survive, and the fear was that people would be totally demotivated. Nevertheless, we had to send the bankers and shareholders a message that we were serious, and the cuts were implemented.

Probably because the freezes and cuts were implemented across the board, there was a sense of shared contribution. The fact that we had made a *shared* sacrifice softened the loss of the real dollars. In some perverse way the place was fun to work in by now. Many of us felt part of an exciting adventure in which everything we did or saw was potentially significant. Every day one looked forward to coming in to work to follow the twists and turns as the story unfolded. There was a shared recognition that this was an extraordinary time and that we were learning, both as individuals and as an organization. In the past it had often seemed that the upper levels of the hierarchy were insulated from hardship: now it was clear that no one was exempt. We were a much more egalitarian community than we had ever been before, and this new ethos was affirmed daily by our behavior.

Strategy Emerged

We had been thrust into the crisis without warning, and our initial activities were almost entirely reactions to issues that imposed themselves upon us. But as we muddled along in the task forces, we began to find that we had unexpected sources of influence over what was happening. The changing relationship with the bank illustrates this neatly. Although we had no formal power, we found that by framing a confusing predicament in a coherent way, we could, via our network, influence the outcome of the bank's decisions. The same applied to our suppliers: by briefing them ahead of time and presenting a compelling scenario for the recovery of their advances, we could influence the decisions they would make.

Slowly we began to realize that, although we were powerless in a formal sense, our networks, together with our internal coherence, gave us an ability to get things done invisibly: we could shape the unfolding story. As we discussed the situation with all the parties involved, a strategy began to emerge. A complicated financial/tax structure would allow the bank to 'manage' its losses and give it an incentive not to call on the shareholders' personal guarantees. The core steel distribution business could be refinanced in the process and sold to new owners. The wrangle between the shareholders could be resolved, and each could go his or her own way. All that had to be done was to bring all the parties together, including a buyer for the steel business, and have them agree that this was the best course to follow. Using our newfound skills we managed to pull it off.

We had entered the ordeal with $500 million in sales and 3,000 employees. The takeover and subsequent merger with the steel fabrication business boosted these numbers to $700 million and 4,000 employees. We exited four years later with $220 million in sales and 800 employees. Russel Metals, as the business became, would go on to become a successful public company in it own right. Today (2019) it is one of the largest metals distribution companies in North America with sales in excess of $3 Billion and over 3,000 employees. Almost everyone who was involved in those turbulent times has long since left the organization. Some went on to work for other firms. Others set out to start new ventures, utilizing the skills they had developed and the personal abilities they had discovered. Everyone agreed that the four years had been an incredible learning experience. Personally I had a new mission. The experience had helped me realize what I really wanted to do with my career and my life – help people make sense of their experience. In this process I became a management educator.

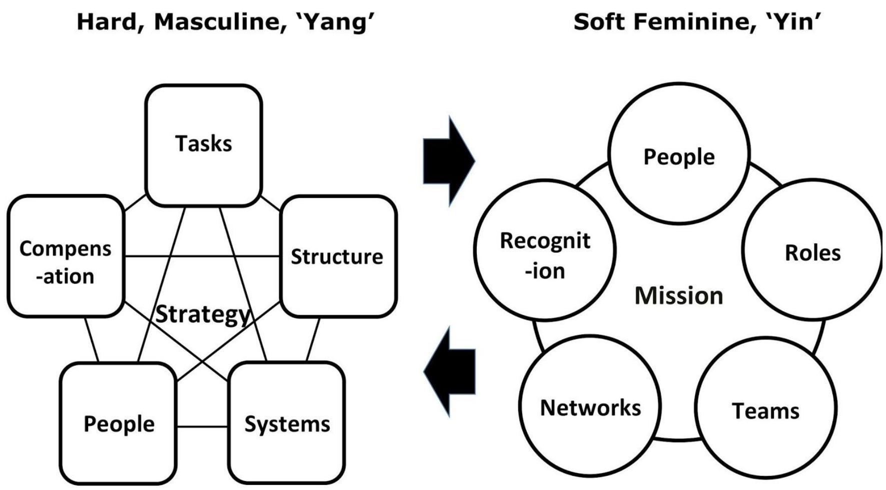
Making Sense From Experience

The two most obvious features of our experience as an organization had been the role of crisis in precipitating change and the nature of that change. It had not been a transformation from one type of organization to another so much as a figure-ground reversal, where a little-noticed form of the organization suddenly came to the foreground and the previously dominant form of organization retreated to the background. For instance, although the cross-functional teams, operating in 'bubble' mode, came up with options and recommendations, they didn't always agree on them. We would consider the issues on a larger team and then, if no resolution was available we would turn to 'hierarchy-on-demand'. For a brief time the formal 'box' structure would come to the fore and we would make an executive decision. Then we would immediately revert to the 'bubble' dynamic so it would remain the default during those turbulent times.

This figure-ground switching dynamic was why I turned to a Taoist, yin-yang framework to make sense of it. The softer, informal 'yin' aspect of the organization had always been there, but barely noticed in the background and masked by the aggressive, formal 'yang' figure in the foreground. With the coming of the crisis these two had reversed. Later, when the crisis was past, figure and ground would reverse again and the more formal organization would return to the fore but with more flexibility than in the past.

I wrote an article using this framework called 'Of Boxes, Bubbles and Effective Management'. It was published in the *Harvard Business Review* in May 1984, where it became a 'bestseller'[6]. After the experience our mental model looked like this, with the two sub-models in a reciprocal relationship:

[6] Hurst, D.K. 1984. "Of boxes, bubbles and effective management". *Harvard Business Review* 62, no. 3:78-88.



The Adaptive Cycle

I made several presentations to universities based on the article and when I was at York University I met a doctoral student, Brenda Zimmerman[7] who was looking for a corporate subject on which to base her doctoral thesis. This began a fruitful period of cooperation between us. She ended up using Hugh Russel as her subject for study and her thesis on Chaos, Strategy and Equilibrium[8] analyzed our experience from a complexity perspective. In that process we wrote a couple of academic articles together[9] and she introduced me to complexity and

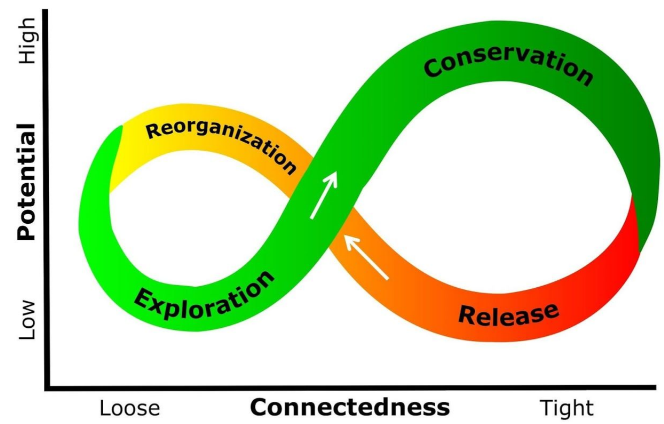
[7] Brenda Zimmerman became a well-known authority in the complexity field. She died tragically in an automobile accident in 2014.

[8] Zimmerman, Brenda J. 1991. Strategy, chaos and equilibrium: A case study of Federal Metals, Inc. Ph.D. dissertation, York University, North York, Ontario

[9] Zimmerman, Brenda J. and D.K. Hurst. 1993, "Breaking the boundaries: The fractal organization." *Journal of Management Inquiry* 2(4) (December): 334-355

in particular to Canadian ecologist, C. S. Holling's adaptive cycle[10]. It was the adaptive cycle that helped me make sense of the primary feature of our experience – the central role of crisis in change:

The Adaptive Cycle



Source: Adapted from Lance Gunderson and C. S. Holling, *Panarchy: Understanding Transformations in Systems of Humans and Nature,* Island Press, 2001.

Ecosystems exemplify the behavior of complex adaptive systems, where many interdependent objects and agents interact to produce emergent phenomena of all kinds. Ecosystems are unstable, but in a systematic way. The adaptive cycle, a process shaped like a Mobius strip shows that they go through two very different phases. There is a slow 'front loop' stage that sees the system go from birth and exploration of its environment through growth and maturity to a conservation stage. This phase maximizes production and accumulation. The second phase is one of destruction and reorganization as the system's resources are released back into the environment. On a rapid 'back loop' the system

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Hurst, David K. and B.J. Zimmerman. 1994. "From Life Cycle to Ecocycle: A New Perspective on the Growth, Maturity, Destruction, and Renewal of Complex Systems." *Journal of Management Inquiry* 3(4) (December): 339-54

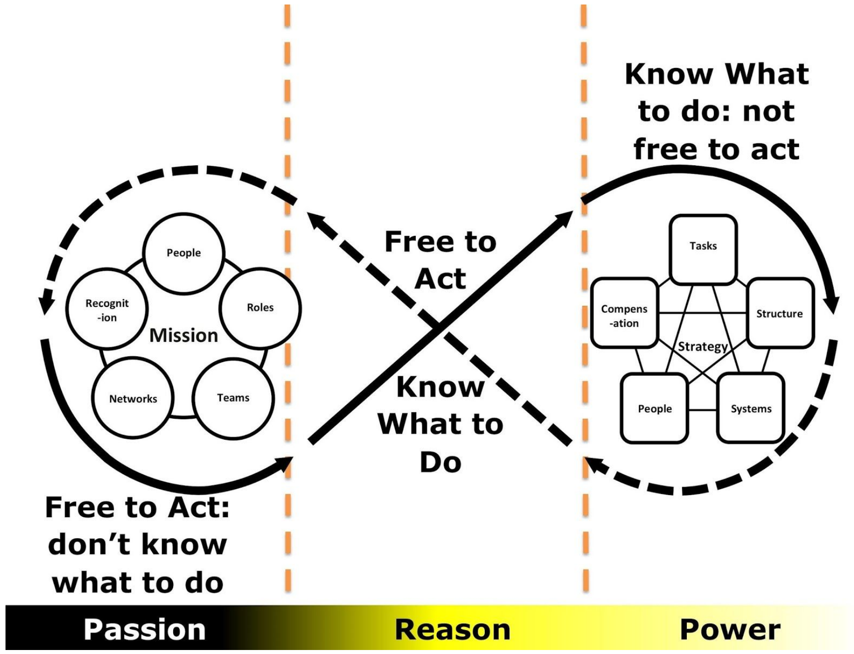
[10] Gunderson, Lance H. and C.S. Holling, eds. 2002. *Panarchy: Understanding Transformations in Human and Natural Systems*. Washington, DC.: Island Press.

maximizes invention and the recombination of resources. To be adaptive a system must generate both these two loops at scale and in sequence, for success in achieving one sets up the conditions for the other.

The Ecocycle

As soon as I read about Holling's adaptive cycle I realized that the metaphor, adjusted appropriately, would make a useful lens for understanding the trajectories of human organizations. It would provide a grand narrative for explaining how soft 'yin' organizations became 'yang' and how yang forms change back into yin. The first thing to do was to add a cognitive framework to the model to reflect its application to the human dimension. In his book, *Ecodynamics*[11], Kenneth Boulding writes about three great catalysts for cooperation among humans; integration (our need to belong), exchange (trade and barter) and threat (power). I labeled these three factors passion, reason and power and added them to what Brenda Zimmerman and I had named the *ecocycle*:

[11] Boulding, Kenneth E. 1978. *Ecodynamics: A New Theory of Societal Evolution*. Beverly Hills, Calif.: Sage

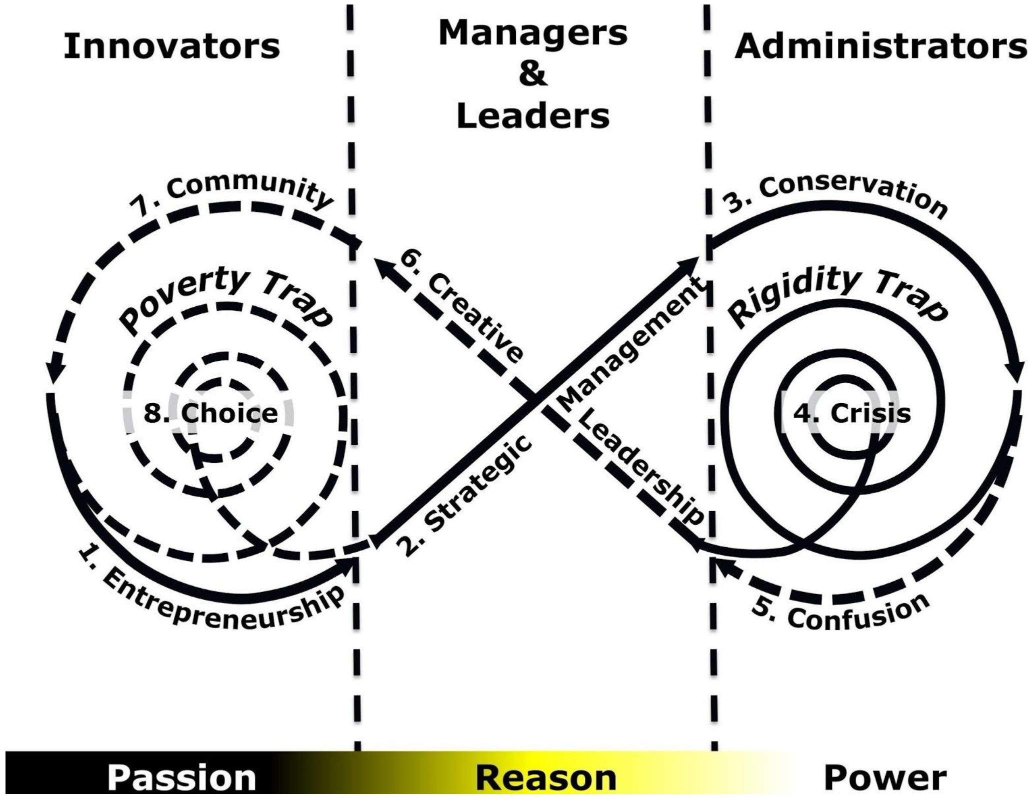


The Ecocycle Showing the Development of Organizations Over Time

What this iteration made clear is that enterprises begin their lives as 'yin' forms of organization, maximizing invention and the improvisational combination of resources from the surrounding community. With no logic of cause-and-effect to guide them, action is guided by passion. Most of these efforts are stillborn, a significant number of the remainder die soon after birth. The few that survive undergo a predictable succession of organizational forms that become more 'yang' as they become more efficient, both to exploit economies of scale and to maximize production and accumulation. The solid line of the front loop, S-curve of the cycle, represents this long, slow process, guided by reason as a logic of cause-and-effect emerges and is refined. This recipe for success is codified and formalized to ensure that the organization does not deviate from it. The resulting rigidity, however, sets the enterprise up for surprise – crisis and destruction – but with the possibility of renewal. Crisis knocks the organization into the back loop of the ecocycle, represented by the dotted line of the reverse S-curve. This line tracks the path at Hugh Russel followed after we were plunged into crisis by the leveraged buyout and the subsequent rise in interest rates.

Yet another addition to the ecocycle is required. Experience with human organizations suggests that there are systems ‘traps’ at each end of the ecocycle. On the left-hand side is the entrepreneurial or poverty trap, where many attempts are made to find viable strategies, products and services but none are forthcoming or those that are developed fail in the marketplace. On the right-hand side is the competence or rigidity trap, where the system is unable to break out of the habits and routines that have made it successful. It is the role of crisis to shatter these constraints.

The addition of these twin spiral traps together with some familiar management terminology provides a basic model for understanding human organizations through an ecological lens:



The Ecocycle With the Twin Traps and Eight Stages

Enterprises are conceived in passion, born in communities of trust, grow through the application of reason and mature in power. Here they tend to get stuck, with their senior managers cut off from what is happening on the ground. This sets them up for disruption, crisis and destruction, but with the possibility of renewal. Renewal requires creative leadership to bring the survivors of the crisis back into communities of trust and practice. The role of such leaders is to create meaning and to assemble a compelling shared narrative of what it means to belong to such a community. It demands that the leaders get back 'on the ground' to understand the experience of their people and what exactly is happening at a fine-grained level. It requires that people be treated, not as instruments of corporate purpose, but as ends-in-themselves with their own personal goals and narratives of identity. The output of this process is the answers to the existential questions: "Who are we?", "Why do we matter?", "What is our mission?"

The existence of the two traps at either end of the ecocycle dynamic suggests the presence, at least in theory, of a 'sweet zone', an adaptive space between them. This space is analogous to the so-called 'edge of chaos'. The edge of chaos is best thought of not as an edge but as a region of emergent complexity, a zone where the organization is perfectly poised between stability and change. It has been suggested that such a region lies between the "edge of order" and the "edge of chaos"[12]. Another way of thinking about this space is as a "liquid" phase between gas and solid. As a firm comes into being, it as if it "condenses" out of a gas into a fluid, and then when it become a large-scale formal structure, it is as if it "freezes" into a solid. Staying in the sweet zone means keeping the organization fluid by oscillating between the "left-hand," evaporative phase transition from fluid to gas and the "right-hand" crystallization transition from fluid to solid. This gives one a new perspective on the standard three-step management change mantra often (wrongly) attributed[13] to Kurt Lewin: Unfreeze-Change-Refreeze, which now comes across as far too linear and based on the assumption that stability is the norm and that change is something that has to be 'managed'. The ecological lens makes it clear that this is far too simplistic a view: complex adaptive systems achieve stability through constant change and change through the presence of stability. It's both…and, not

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[12] Boisot, M., and B. McKelvey. 2010. "Integrating Modernist and Postmodernist Perspectives on Organizations: A Complexity Science Bridge." *Academy of Management Review* 35(3): 415-33

[13] Cummings, S., Bridgman, T. and Brown, K.E. 2016. "Unfreezing change as three steps: Rethinking Kurt Lewin's legacy for change management." *Human Relations* 69(1): 33-60.

either/or.

All Models are Wrong But Some are Useful

The statistician, George Box, once wrote, "Models, of course, are never true, but fortunately it is only necessary that they be useful."[14] This is often simplified to "All models are wrong but some are useful." The purpose of this story has been to follow the trajectory of an organization and its people undergoing transformational change and to show the development of an ecological model for understanding transformation and change in complex adaptive systems. The framework as outlined here still has 'legs' - potential for development - and can be taken much further than this story has indicated[15]. Other sense-making models such as the popular Cynefin framework[16] can be dropped into the sweet zone and the ecological framework can be applied at levels both above and below the focal organization to generate a classic three-level, macro-meso-micro systems view[17]. When combined with the work of Geoffrey West of the Santa Fe Institute[18]it can throw light on how corporations become dominated by the economies of scale and why they die as opposed to cities that can continually renew themselves through innovation and ideas.

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[14] Box, G.E.P. "Some Problems with Statistics and Everyday Life", *Journal of the American Statistical Association*, Vol. 74 No. 365 (Mar., 1979), 1-3.

[15] Hurst, D.K., *The New Ecology of Leadership: Business Mastery in a Chaotic World.* New York. Columbia University Press.

[16] Kurtz, C.F. and Snowden, D.J. 2003 "The new dynamics of strategy: Sense-making in a complex and complicated world", *IBM Systems Journal*, 42(3), 462-83.

[17] For some clues on how to do this see the work of Geoffrey Moore e.g. Moore, G.A.. (1991) *Crossing the Chasm*. New York. Harper Business.

[18] https://www.ted.com/talks/geoffrey_west_the_surprising_math_of_cities_and_corporations?language=en (accessed April 24, 2019)

The ecological model is, of course, not "right". But I hope that you find it useful and that the model and its metaphors become active in your minds as you try to make sense of complexity and uncertainty in turbulent times.