

Compression Thinking and Nature's Business Model

We need an epochal shift in social and economic systems. Globally. And soon. Our existing patterns of thinking can't cope with the future rushing at us.

Mankind and our physical consumption are part of nature's cycles of life, but we can't fully accept this. We're mentally and culturally locked into an expansionary economic system, and can't see how to reverse it – don't know how to survive without it. We're addicted to its goodies, and like addicts, we know our habits are bad for us, but we crave our fix. Willing ourselves off old habits is spiritual as well as intellectual.

We need new stories to live by. We propose a new story, wrapped in new myths, here sketched in six modules that we call [Compression Thinking](#), a start on how-to, but not a detailed map. To think differently, we have to learn to do differently. Our lives will upheave as all of us together learn to embrace a new quality of life – for all life.

1. Earth is Finite and Out of Balance

Over seven billion of us now live on the ball called Earth. Compared to a human, it's big, but not growing bigger. However, it's home to all the confirmed life we know about. Humans are only a [piffling fraction of one percent of the carbon content](#) in all living mass, but energy and machines give us outsized influence on all other life crawling on the ball. We like to think we run the joint. We don't. Nature does. Admit it. There, you've started to change already.

Nature tries mightily to stay in balance. Life builds up by everything eating something else. If evolution has any direction, it's toward increasing complexity of a system to stay in balance. Our excesses knock it out of balance. From our view these excesses are progress. From nature's they are too much CO₂, too much or too little fresh water, ocean pollution, degraded soil, garbage piles, and reduced biodiversity (die offs) – and we spread toxins around (who knows what they do). Why? The money is good. We keep futzing with human systems, where the money is, because money is easy to count.

This can't go on. We are running out of easy places to get fuel and raw materials, but expansion is baked into the economic system. Even compound interest is a growth formula, but systemic expansion will hit harder limits; slow; then stop, and we enter Compression. Our old social and economic systems will implode, gradually or suddenly. So will its sustaining belief that the world is an infinite expanse begging us to exploit it. Although both the planet's limits and our learning capacity are ill defined, our learning capacity doesn't have such obvious constraints, so let's exploit it.

Nature's business model is a "myth" to drastically transform present social and economic beliefs. It's impossible to foresee totally new lives and beliefs, but three easily projected changes suggest society turning upside down.

a. Sometime, somehow, the human population must level off or decrease. That might be by big die offs: war, famine, and disease. A gentler alternative is new “social contracts” for sexual relations, health care (preventive and predictive), retirement (gradual), educating the young, and more. Nearly flat demographic age profiles mean having almost as many elderly as youth under the age of 20. Today we think of adult paid work years as the productive middle layer of an age sandwich: formative youth on the bottom; idle retirement on top. We don’t have to think that way. We might be happier if we thought of life’s progression totally differently.

b. The new economic systems must center on common interests, a total system, human systems balanced with natural ones. Stop growth by competitive, independent private interests, growing just to be growing. Collaborate on total system balance. This would scramble private property legal codes, for instance. And it would supplant the logic the United States used to weaken the Paris Climate Accord, that it was an endless stream of payments for environmental damage. We have to see through non-monetary lenses.

c. Our biggest threat is not environmental collapse; it’s human inability to imagine it. History offers no sure guide to envisioning a nature-centered future. For example, most sci-fi scenarios portray human-like protagonists battling mysterious aliens. Suppose the protagonists were trees, ants, or rhizome microbes. Could we relate to the plot? Tamer projections of technologies like self-driving vehicles imagine disrupting the present economy. They don’t imagine making vehicle economics compatible with nature.

Drastic change probably entails conflict. Few elites will give up their status – or money – peacefully. Most of us hope that a little tinkering will keep the transactional economy going. Intellectually we may grasp why it can’t, but embarking on a very different course must navigate deep, emotion-laden chasms of myths and habits.

To overcome our limited perception, we need more effective learning – “[Vigorous Learning](#).” To motivate that learning, we must develop a deep attachment to nature, a primal urge for it to thrive. Nature’s needs can’t remain subordinate to monetary prosperity and social justice, and billions of people can’t survive by reverting to indigenous living. However, a dose of old indigenous beliefs would help restore environmental health to our environmental beliefs. A written example of indigenous beliefs is the 1000-year old [Haudenosaunee](#) (Iroquois) “Great Law of Peace.” In part it reads:

The universal laws of nature will prevail. These are the laws that direct the lives of indigenous peoples. We must learn again to share, trials and tribulations as well as health and well being..... The Haudenosaunee ancient philosophy of “one dish, one spoon,” to share equally—and these words that go with it, “Nobody owns the woods, but everybody is responsible.”

Anything like the Great Law of Peace mixes like oil in the water of market competitive capitalism, and the world is much more technical than that of the Haudenosaunee. But to actively embrace nature, money-driven societies need a big flip in motivation.

2. Quality Over Quantity, Always

Could this quip become a new myth, or code? A longer version is *quality of all life over quantity of human consumption*. Can we use “Nature’s Business Model” to practice Compression Thinking?

Industrial economies consume too much. We’re stuffed. We buy stuff we don’t need. People give us stuff. Marketing campaigns badger us to buy stuff. (Try it; you’ll like it.) Living just to consume doesn’t even satisfy us psychologically.

The simplest way to cut consumption is just to stop. Cut out non-essentials. Design islands of tight circular economies (re-use, re-cycle... the Rs). We’d have to incubate these islands at first, so they don’t compete with stuff bought and trashed – and priced to exclude damage to nature. We can design long-lived “heirlooms.” And everyone doesn’t need a stash of things used occasionally. Instead form sharing pools for vehicles, tools, hot water, sewage disposal, etc. Using your head with your heart, you can cut consumption more than any top-down regulation. But to do this, we have to change us – live by a “new mythical code” and trust other people to do the same.

By this new myth, what is quality of life? Is it possessing things? No. Consuming things? No. Doing things? Yes. Quality of life becomes the satisfaction of social contributions whether one is paid or not. That’s easier to accept if you believe that our primary purpose in life is to perpetuate life. Then almost all else becomes bullshit work.

[David Graeber](#) defines bullshit work: “it has no social benefit, zip.” This defines waste more broadly than lean operations, which is “anything the customer would not pay for.” Much bullshit work merely manipulates symbols to make money: Financial trading. Legal minutia. PR drivel. Junk mail. Suckering Instagram followers to buy stuff they don’t need with money they don’t have.

Bullshit work piles up into a bullshit economy, but that’s hard to see by those who believe in growth by monetary indicators. To them, bullshit is anything that doesn’t make money. For example, they may regard motherhood as vital, but making money off mothers is serious business. That doesn’t really regard motherhood as “sacred.”

Changing this worldview is a tall order. We’re pre-programmed with an avaricious streak, and these worldviews clash. However, evidence from within the money system itself hints at dysfunctional artificiality. Nature’s Business Model not only draws attention to ecological damage, it makes the artificiality of a bullshit economy glaring.

Artificial competition is a treadmill to nowhere that generates stress. For example, AdSense software rewards video makers with ad money in proportion to the hits they obtain. AdSense drives [YouTube video makers](#) to become stars, but if stars don't keep churning out hits, they lose their fan base. If unable to sustain a creative high, they burn out. And what's the purpose of most ads? To keep the treadmills to nowhere going.

Facebook's and Google's revenue streams (and the technical projects they support) are nearly all funded by advertising. Media companies rely on advertising. If advertising shrinks dramatically (Compression), they either collapse or get new business models.

All this is part of a service economy, which by definition produces nothing. It consumes. But how much of that consumption marks a well-spent life? Critics foresee humans sliding into "brands," on-line avatars existing to be noticed, and rewarded for being noticed. Is living off our own reality shows like living by cutting each other's hair? Virtual games may not damage nature very much, but do they diminish our humanity? What does an economy abstract from nature do for us? What does it do for nature?

Debt is another trouble indicator inside the money system. Debt hides monsters ready to devour transactional systems. In 2008 debt payers at the bottom of the debt pile stopped paying. This blip ricocheted through a tightly interlocked system to become a recession. Global debt, now piled up to [around \\$200 trillion](#) and climbing, is hiding more latent monsters. In addition, debt no longer fuels transactional growth like it used to. The business world is awash in cash as well as debt; even by its own criteria, the old model is sputtering.

To see what to do, we need to don different lenses, both locally and globally. Nature's Business Model is a different lens that clarifies that we must substantially change ourselves, how we think, and what we do. For this we need more "realistic guiding myths." Perhaps one of them is Quality Over Quantity, Always.

3. Organize for Effective Learning

Nature evolves by everything reacting to everything else, so it's a complex system. If its change has any direction, it is toward increasing complexity, as nature promotes more life as a balanced whole, integrating more factors than we can comprehend. If we perturb nature faster than it can adapt, we risk future planetary welfare – for us and for all other life with which we are symbiotic. Nature's Business Model says to learn deeply at nature's speed.

New learning tools are also evolving rapidly. Coming on fast is artificial Intelligence (AI) and its adjuncts. They detect patterns we miss. AI can generate hypotheses impossible for unaided human senses and intuition to conceive. For example, Google is now [venturing into health prediction](#). (Whether Google views health care as a big enough system is open to question).

Systemic learning centers on humanity's most important question: Why. Why does this happen? Why do this? To benefit ourselves? To benefit nature? Asking why nudges us to probe causal linkages between human and natural systems. Can we and nature adapt together after a large-scale system intervention? The better we define causal loops, the better we can answer this question, learning from a broad, systemic view of "economic progress."

The learning needed to project monetary returns is faster (when will we hit pay dirt), but it's seldom broad or deep enough. Unintended consequences lurk in the factors it ignores. If seen at all, they are "external costs." Nature has no external costs.

A useful concept is the learning energy expended to obtain actionable knowledge. Suppose your computer's software continuously updates faster than you can master its new tricks. You would give up, frustrated by hours learning software that never does anything else for you. Learning the intricacies of software, computer games, or other artificial systems is waste (bullshit) if it serves no further purpose.

Much of the whole economy is like this – as David Graeber implies in [Bullshit Jobs](#). It twiddles the intricacies of consumer fads, legalities, entertainment trends, credit status, and the like. Little of it addresses ecological effects, directly or indirectly. To learn deeply at nature's speed, we have to learn about nature; get in synch with it.

Personal awareness of nature will do for most daily decisions, but when making decisions that significantly perturb nature, no lone genius can master all that should be considered. Personally, I spend much of my time searching and observing, but am dismayed by how much I miss. To fully understand a relevant system, we have to learn together; then integrate what we learn individually. That's Vigorous Learning.

We associate learning with formal schooling, but much of what we learn is seared in by experience. Some of it is tacit, not readily codified. If this learning is hit-and-miss, we repeat the same mistakes. If we learn too little to trigger what if questions, we may even remain ignorant of unintended consequences. For example, we may not realize that herbicides and insecticides killed 90% of the pollinators in the county if we were blissfully unaware of pollinators before spraying.

Intelligence helps, but each of us have limited sensory capacity. To offset this, we should expand our perception, but instead we often narrow our focus. We may think this is efficient, but it mentally separates us into silos of separate focus. In business, we focus on factors that we think represent success – customers, financials, and growth. Those are abstract from nature. By Nature's Business Model, that success is artificial.

By narrowly defining success, we don't vigorously observe the [Precautionary Principle](#), which is *the initiator of an intervention is obligated to show evidence that it will not*

harm nature or humans. Perfunctorily complying with regulations may cover us legally if anything goes wrong, but the Precautionary Principle is beyond legalities. Vigorous Learning delves into nature with empathy for it. Of course, the learning time researching by the Precautionary Principle is apt to slow competitive races to market, but if market success is illusory anyway, a new myth should guide us, *Quality over Quantity, Always*.

In practice, no one can guarantee zero harm, so the Precautionary Principle comes down to environmental wellbeing topping project criteria along with human wellbeing, balancing interests as far into the future as we can see. This must be preplanned, not an afterthought. For example, it's impossible to promptly restore the electrical [power system of Puerto Rico](#) while hardening it to future disasters and balancing its impacts with nature.

To creatively balance diverse interests, we must learn new habits and beliefs – and unlearn old ones. If human comfort and convenience no longer have the highest priority, consumers have to learn too. Consumers accustomed to getting anything they can afford will probably resent this “loss.” However, if consumers don't consume, providers don't provide, and environmental footprints shrink.

Today's expansionary “free market” commercial logic has to disappear. Part of that logic is that I “deserve” any technology that I can buy. By extension, capitalist theory says that if I can obtain a better return on property than you, I should buy it, and you should sell it. Our agreed price rises by factoring in my greater gain because I can “sell more” than you, so we both “win” – by the numbers.

This is expansionary economic logic at its finest. We all get a slice of a bigger pie. But if we all cut back because we are collectively consuming too much, the pie shrinks. By expanding pie theory, in Compression everybody loses. But by Nature's Business Model, in over-expansion everybody loses. So expand our view of success to include both nature and forgotten humans. By Nature's Business Model, to collectively survive, we allocate pie. Compression Thinking and Nature's Business Model are a coming necessity in need of improvement, but they should make obsolete capitalist-socialist conflicts about now to make and divide a pie.

We're entering a new era where more is not better. That's a deep change in beliefs. To transition we propose [Vigorous Learning](#) to close the gaps between concepts and action. We need new beliefs as well as new skills, but as lesser transitions (like lean) portend, most of us acquire new beliefs by first learning to do differently. No stunning flash of insight instills a very long-range viewpoint over a wide area of comprehension.

4. Measure Primarily by Nature's Yardsticks

Nature's Business Model starts with “Why?” How does nature work and we with it? To concoct measurements, ask what nature must have to care for itself. These

measurements should tie to nature. Measurements tied to monetary exchange are just for human trading and are not the dominant factor making decisions.

First hand estimates of nature, like species counts to estimate biodiversity, are time consuming, but if well done, the estimate tries to represent reality. Better to use the real counts than to kid ourselves attaching artificial human valuations to them.

Energy gained for the energy expended (EROI) is a natural ratio. Just thinking in EROI terms sharpens intuition. Any organism that cannot gather as much energy as it expends is dying; its EROI ratio is below one-to-one. A vigorous animal can expend an energy surplus. A “strong” local economy has an energy surplus, drawn from elsewhere. That elsewhere probably has an energy deficit. Historically, cities and empires sucked an energy surplus out of their hinterlands and often wasted it; then in a pinch had to revert to less energy-intensive ways of living – if they could.

Earth draws most of its energy from the sun. As a whole, nature has no energy balance; its balances are flows between regions on the earth. As nature sees it, an area with a big energy surplus or deep energy deficit is out of balance, and ecologies suffer. In healthy ecologies, life captures every tiny sliver of energy.

We love big energy surpluses; however wisely controlling them has to repress human impulses like the bumper sticker in Texas, “Dear God, just let me have one more good oil boom and this time, I promise, I will not piss it all away.” If we could siphon infinite energy from the universe for free, would we play stupid games until we killed all life?

In practice, gathering data for an EROI study is time consuming. If more thermal data were compiled and accessible, EROI estimates would be easier but the insight gained by doing original EROI studies is worth the effort. They remind us that big energy imbalances are unhealthy both for us and for ecologies.

Monetized measurements are deceptive. For instance, you can make a profit by using cheap energy to generate expensive energy when EROI is less than 1/1. Money values to the penny are falsely precise. They link to self-referential webs of price pegs: nearby real estate values, price indexes, returns on money, and the like. Analyses caged in this financial cloister neglect anything not assigned monetary value. Nature is more diffuse. Exploring nature is to learn about how elements of a complex system relate to each other, not just to us. Vigorous Learning should do that.

Despite its limitations, money was a priceless invention! Comparing everything using a common reference, market values, is essential for trading, but trading valuations should not dominate all decisions. Market-based comparisons almost always signify “value” to humans – to me, my company, my town, or my nation. “Value” external to immediate human interests is a concept outside monetary frames of reference. When we apply a monetary value to services nature provides us, we are still in that frame of reference.

We strain to monetize relationships that can never be traded. Can you monetize motherly love or weed lots loaded with pollinators? Measuring nature using our core interests as reference points has severe limits. We can't fully comprehend nature on our terms. We have to comprehend nature on its terms.

Fortunately, executive intuition compensates for many well-known biases of monetary calculus: Short-term focus. Assuming the future will be much like the past. Presuming that a company's operations are the sum of its parts, ignoring interactive workflow and communication. Presuming that separate companies operate independently. But executive intuition doesn't compensate for narrow pursuits forced by the system.

Little illustrates the debacle of unchecked pursuit of a single-minded goal – growth – better than the [Paperclip Maximizer](#). It's an AI game that outwits human opponents making paper clips in perpetuity. Unless its plug is pulled, it fills, first the earth, then the entire universe, with simulated paper clips and paper clip making machines.

Business logic is filled with hard-to-see biases: Bureaucratic bullshit work is only one. More serious is that independent actions will lead to a desired overall outcome. That works for growth, not for Compression. For instance, suppose vehicle fuel economy doubles, but vehicle miles travelled triples; total fuel consumption keeps growing. Related to this, and not restricted to executives, is that a few incremental, independent reductions in environmental damage will let the system *continue expanding*. In Compression, one must be much more aware of total system effects. Penetrating such bias is why we need Compression Thinking with Nature's Business Model.

Actually behaving by the economic man model compounds delusion. By that model everyone acting in their own self-interest maximizes collective good, which is sociopathic at the personal level. At a system level, it's unstable. Evidence from within the system points to instability. Debt is mounting. If a system can't grow, pumping money into it piles up mountains of debt, both public and private. (Creating money to bail out hopeless debtor nations, like Greece, Argentina, etc., actually bails out the financial institutions holding the debt. They still have non-performing loans while the debtors stagnate in modern debt servitude.)

Compression Thinking integrates a wide spectrum of thinking, but may have to work its out of the past under the rubric of the system's own legal structures. Many fledgling environmental initiatives frame collective action as co-ops, land trusts, intentional communities, and neighborhood associations. They confound social justice with environmental action. The pioneers are fumbling for a new social system, more than a restructuring of the business system. They are weaning off mainline business.

5. Science-Based Evidentiary Learning

Few of us regularly use any variation of the basic scientific method. By any variation, the heart of scientific learning is seeking evidence to support models (myths) explaining how things work. Biological reality is always changing; facts observed today may not be facts forever. Full comprehension is impossible, but we ceaselessly seek better models.

Scientific learning must deal with bias. We all have confirmation bias; we see what we expect to see. And we have emotional bias against any finding that threatens our status or money. For example, a pharmaceutical company makes money only from cures. It may ignore evidence on how to stay healthy, not needing a cure. And researchers waffle reporting any finding that might disappoint their funding sources.

Use Nature's Business Model to pry up ordinary bias. Exert more mental energy to explore systems beyond their potential to benefit us. This can be done if we escape the myths that economic development and technology will resolve all problems (Silicon Valley solutions). What's our new myth? Mankind is just one player in the grand panoply of nature – just part of nature's web of life.

Unfortunately, mental laziness goads us to guess at causality or finger culprits. There! Problem solved. Next? Unless we deadlock in conflict, this is much quicker and easier than systemic learning. Resolving issues with minimum rancor consumes both our time and our emotions, but lead to more durable system interventions. To inspire eagerness for mutual learning, we need beliefs and myths that frame why we should.

To trust evidentiary mutual learning and dialog we must trust a myth more realistic than the idea that "scientists" magically ferret "truth" out of the fog of ignorance. More realistic myth is that all scientific thinkers' learning discipline seeks unbiased models that better represent reality. That is, science fumbles faster toward an understanding of the unknown.

In this sense, we all need to become scientists cognizant of science's weaknesses. One is fragmented research not tied into an overall systemic view. For example, let's say that a nutrition study claims "with 95% probability that consuming red wine decreases the probability of a heart attack by 10%." But is wine really *the causal agent*? Question missing evidence: What other variations in life habits of drinkers and non-drinkers might explain this? What were their variations in drinking habits? Humans do not self-report their habits very accurately or completely. Did the difference apply to all subjects, or a subgroup? Such fragmented studies lead to conflicting nutrition advice – and fads.

System, collective scientific learning is an element of Nature's Business Model. And all science should be validated by evidence at the level of sensory experience.

6. Systemic Thinking

Stories are our oldest way to describe a system. Some are fictional myths – or blatant lies. Others try to represent reality. But to hold our interest, any story has to hang together. To paste story elements into a coherent theme, writers tick off the reporter’s five questions: Who? When? What? How? And Why?

A reporter covering a totally unfamiliar topic under deadline has to organize a story’s elements into something that articulates the “truth,” as best she can learn it. Some facts may be wrong. Her grasp of the story’s background is limited. She will have to follow up, correcting errors and fleshing out the story, and if diligent, scrupulously check facts. Fiction writers may not do this, but all interesting stories are coherent narratives.

Fiction writers hook readers with a protagonist, a character that readers can identify with, so they can imagine themselves in the story. Unlike fiction, stories that describe systems like the behavior of sub-atomic particles seldom use a protagonist – unless they are children’s stories. They often use protagonists to paint pictures in children’s minds and models in their logic. A story can be hokum, but if it satisfies curiosity, it shuts the kid up until she craves a better story – wants to learn more.

Adult learning is not that different from children. We want the inside scoop on how systems “really work.” When old stories no longer “work for us,” adults crave better ones – better myths. Shared myths harden the cultural glue sustaining confidence in a social system. A myth so common today that it is rarely questioned is that economies must grow or die. Upending this myth will be a mighty social upheaval. In Compression people must learn to analyze systems anew – beyond old myths and stories about them.

Causal Linkages and [Metaphorical Scaffolding](#)

All stories infer causal linkages. Ludicrous ones are just for fun, while serious ones model reality, and if scientific, cite evidence. However, all are incomplete, and some flat wrong. Enter Vigorous Learning: First seek a complete, realistic description of a system. Then exercise the Precautionary Principle to seek a sensible intervention. To test alternative interventions, we need confidence predicting how a system will react to proposals, confidence that comes from personally digging out the causal patterns of systemic feedback loops. Quantifying feedback helps, but completeness identifying feedback loops is essential for foreseeing success or disaster.

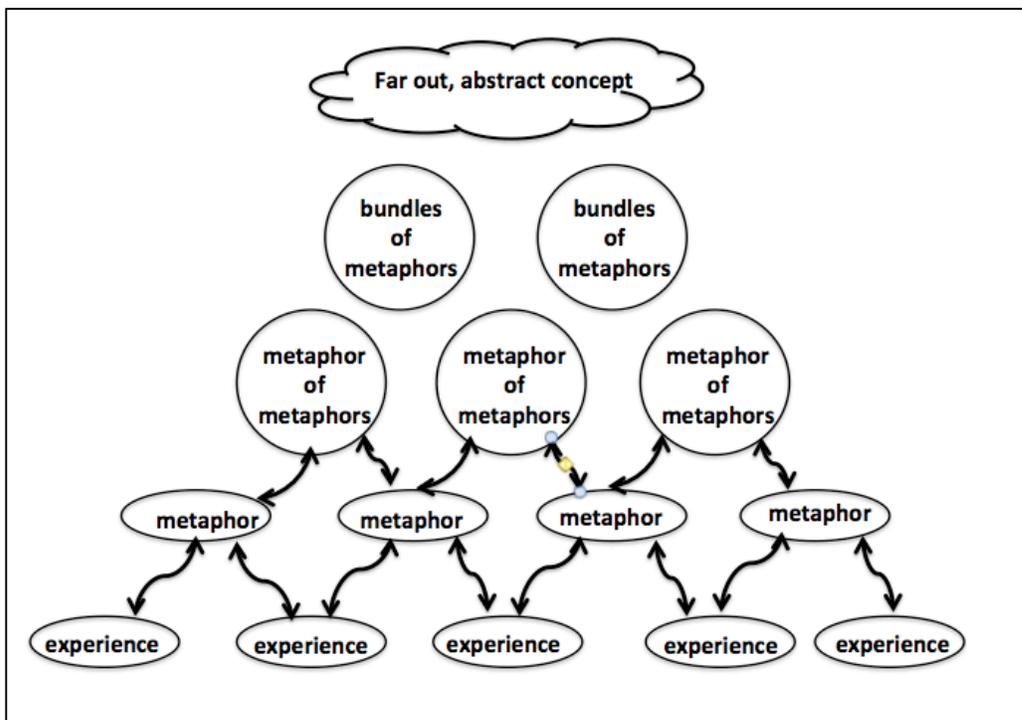
Most of us can intuitively analyze a familiar system, sensing causal linkages that we may not articulate. Reading human motivations is intuitive, and essential when navigating organizations awash in “politics.” Whether intuition is uncanny or “out-of-touch” depends on the extent of the vibes we sense and our insight interpreting them.

In a visible, tangible mechanical system, where cause and effect should be easily seen, intuition is supposedly minimal. Don’t bet on it. Factory rats brag about sniffing out “old dog” quality defects on a hunch. People resolve procedural and mechanical problems

faster by gathering data and following a search protocol like PDCA cycles. But behavior is still key to doing PDCA well: concentrate on the process, not human game playing. (I once worked in a factory where no one dared improve a process set by a V.P. 20 years earlier.) Improvement never ends because “complexity growth” (mission creep and environmental changes) disrupts a smooth working process. Nirvana never comes.

We learn by combining abstractions, as in Figure 1. A flow diagram is only one stage of abstraction from a work process it represents. Other complex systems float many stages of abstraction away from immediate see-hear-touch-smell experiences – as in sub-atomic particle physics, now so abstract that it struggles to confirm its models with physical evidence. Global mortgage derivative markets are many stages of abstraction from the tangible structures to which mortgage values are tagged.

Figure 1



[Metaphorical scaffolding](#) explains learning as building up abstract concepts as mixes of images directly experienced by senses. This theory is an explanation empirically supported by neurological research. Maybe it is useful.

Starting as children we build up metaphoric analogies, “This is like...” Over time these metaphors become a big mental inventory. To imagine new concepts we rearrange our metaphoric building blocks. Some of us stack up metaphors on high scaffoldings rising up to philosophical abstractions. Others clump metaphors that help them picture the tangible here and now. For example, a mechanical drawing that paints a picture in some

minds is a meaningless jumble of lines to others. We don't accumulate the same metaphors, nor do we combine them into the same abstract concepts.

In some fields, lifelong experts appear to file their metaphors in "chunks," a phenomenon well studied in chess players. They don't re-analyze previous experiences from scratch. [Grandmasters drawing on chunks](#) sink amateurs within a few moves.

But does specialized chunking inhibit learning in new contexts? What is a grandmaster's chunks without chess? Why do environmentalists resort to financial analogies to help managers understand environmental issues? Is it because many managers lack enough directly sensed images to build their own metaphors about nature? Do "tone deaf" people never build enough metaphors to interpret behavior?

How to Agree on Causal Linkages

Our rootstock of experiences varies. Our scaffoldings vary. Factor in personal limits of perception and biased metaphorical stacks and no wonder we picture the same systems differently. Having different mental pictures of a system inhibits agreeing on its cause and effect loops. How can we create mutually agreed pictures and patterns of causal logic? Better analytic tools alone are not enough. We must learn to collaborate assembling a common picture of a system. This takes patient discipline, but it can be done. It's helpful if participants realize that we possess different learning scaffoldings.

Start with basic dialog rules: Genuinely listen to others. Speak one at a time. Involve all parties concerned – including "nature." Be sure each is heard. Respect other participants' time and energy. Try to present your perspectives clearly and concisely.

Collective understanding of a system and its causal patterns is the first objective of a dialog. Making a decision or taking action is less contentious if we start from an agreed overall system description and causal pattern. Probably the simplest version of agreeing on a system's logic is creating a "value stream map" to begin a lean transformation.

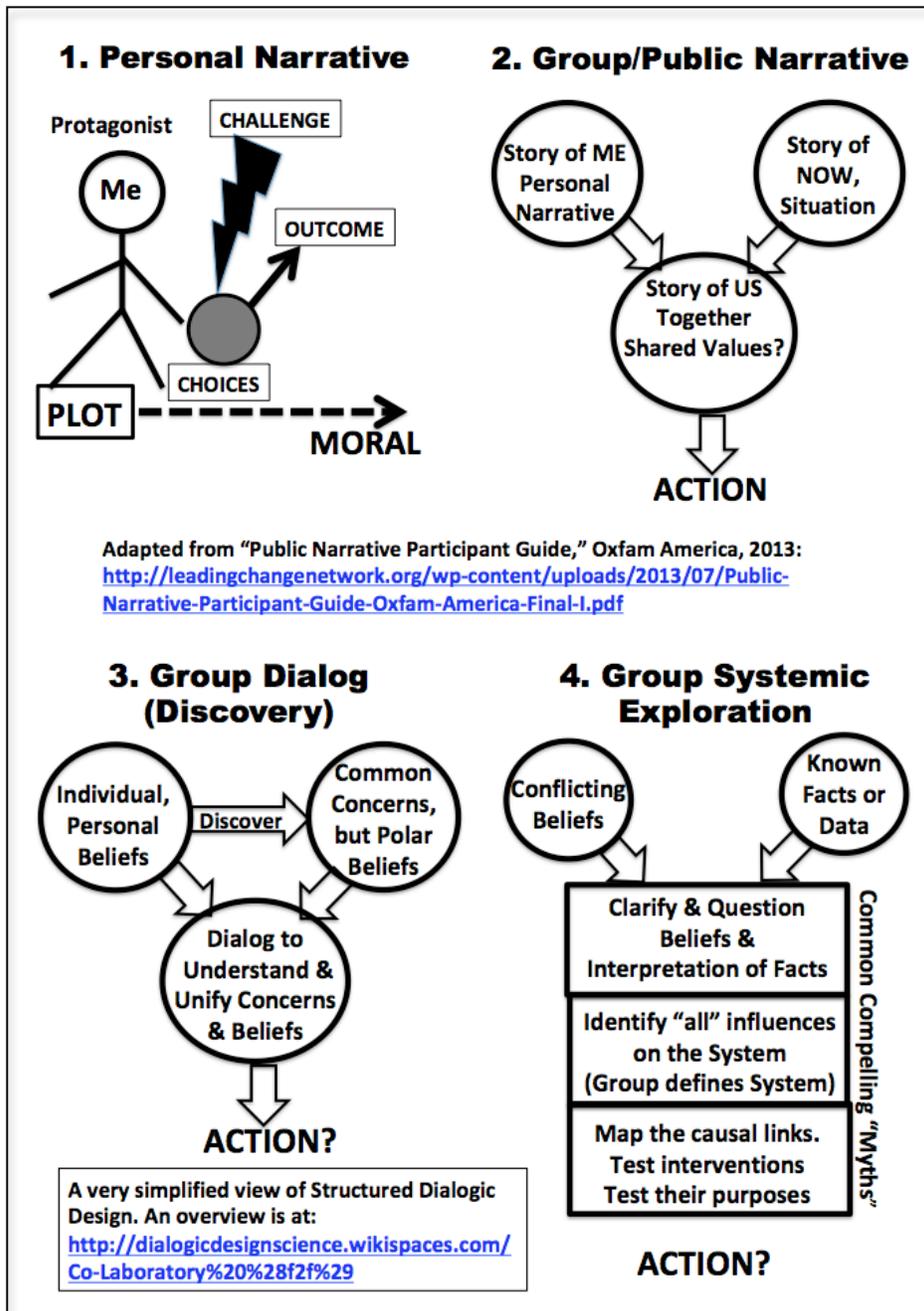
Simple rules, but the mental and emotional discipline to use them may not be simple. Some of us are domineering; others shy. Some are impatient (to get it done). Many avoid responsibility – and the consequences if things go wrong, often called having "skin in the game."

In business, "skin in the game" usually means standing to gain or lose money. But in a world entering Compression, everybody has skin in the global game of life, and we have to unravel more environmental issues than any one person can know.

No system seems more complex than mankind's systems coupled with our earthly ecologies. However, most interventions will be local, but from a global view. (Will my nitrogen fertilizer screw up fishing 1500 miles away?)

People not inured into systems thinking must be lured into it. Figure 2 is a progression in human group interaction for systemic analyses:

Figure 2



1. A personal narrative may inspire individuals imagining themselves in the story. But except for persuasion campaigns, stories go every direction. They don't promote group

cohesion or action. Although some stories may surprise us with new ideas, we gravitate to stories that confirm our preconceptions and biases.

2. A group/public narrative describes people with similar personal narratives coming together for a common purpose. In the diagram that purpose is generic – fill in the blank. No structured format guides people. Instead the diagram presumes personal leadership and persuasion, and nothing overtly promotes civil discourse. For instance, the diagram describes how contentious political blocs usually form.

3. Group Dialog is a structured format. Dialog rules guide participants generating a common understanding of a system or a process, and maybe a common system objective. Dialog rules calm the discourse and open participants to new insights about the system feedback loops, the situation, and each other. Distilling the wisdom of the group may turn up surprises. (For example, we're part of the system, and the root of its problems is that we don't trust each other). Dialog may proceed by relatively simple rules or it may advance to the software-interpretive level of [Structured Dialogic Design](#).

4. Systemic Exploration employs dialog rules, but it urges participants to expand learning to complex messes combining human behavior, human systems, and nature's systems. That is, it invokes Vigorous Learning to identify and cope with the emerging problems of Compression. The group will need to research questions when no one in the group can provide credible evidence. Doing this presumes a human maturity way beyond insult contests to intervene in complex systems. To be motivated to dig in this deeply, participants need to "believe in Compression." Seven beliefs, or semi-mythical themes seem essential to motivate Systemic Exploration:

1. Earth is finite. We must cut consumption, and in advanced economies, dramatically. Despite overwhelming evidence, this necessity has not generated convincing myths.
2. We are part of nature and it is our teacher, so pay attention.
3. All humanity is in this together; stop abusing nature with human win/lose games.
4. Safeguard all life: preserve the health of nature, so it preserves us.
5. Life satisfaction is from serving social and ecological good, not from acquiring "stuff."
6. Learn to reason by evidence using scientific methodology and systemic thinking, with nature as a reference. (Science suffers from fragmented studies and monetary biases.)
7. Create human trust to collectively learn what we cannot master independently.

These seven "rules for living" deviate substantially from the economic myth of endless expansion and all its supporting myths. No one can make such a huge change in thinking

in a day. That's why we need new guiding myths that motivate us to become "better people" and better stewards of earth by thinking symbiotically with it.

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