LEADING IN COMPLEXITY

Grow your capacity to lead in complex systems.

1. INTRODUCTION TO COMPLEX CHALLENGES

Issues like poverty, ethnic conflict, and climate change are incredibly dynamic and complex, involving an ever-shifting array of factors, actors, and circumstances. These challenges demand a more fluid and adaptive approach.

While we can shy away from these challenges because they're so hard, understanding complexity leads us to a different perspective. We can see these challenges as opportunities for change.

LEARNING OBJECTIVES

1. Understand what makes systems "complex" and the characteristics of complexity
2. Understand what makes challenges characterised by complexity different from other challenges (for example technical problems)
3. Understand the differences between responses to complexity that are "fit for purpose" and those that are not.

WHAT IS COMPLEXITY?

CORE CONCEPTS

Complexity is a characteristic of a system (e.g. a city, the energy system, a nation state) that increasingly determines how our systems behave.

A system that we call complex will have the following characteristics:

Emergent - the path that these systems follow is unpredictable, we cannot accurately foresee what will happen.

Information - systems that are complex generate large amounts of information; more than we can know the entirety of at any one time, so we are always operating in a context of uncertainty.

Adaptation - behaviours change in response to new information about what is happening contextually. This happens spontaneously and autonomously at multiple levels, which can lead to even more emergence.

SOURCE: "COMPLEXITY: A GUIDED TOUR", BY MELANIE MITCHELL

AXIOMS

AXIOM 1

Paradigms are built from practices; practices are built from tools, processes, spaces, ingredients, and customs.

A paradigm is "a theory or a group of ideas about how something should be done, made, or thought about" (Merriam Webster Dictionary). We can see the world as complex, or we can see it as non-complex or 'technical'. Another example is seeing the Earth as flat or as a sphere.

Paradigms affect what we do. What we do is our practice.

SOURCE: "THE STRUCTURE OF SCIENTIFIC REVOLUTIONS", BY THOMAS KUHN

Thomas Kuhn, author of The Structure of Scientific Revolutions, writing over half a century ago, provides the most accurate description of what is happening with the conflict between complexity as a paradigm and the older "modernist" paradigm that sees the universe as something technical or non-complex, like a clock:

"A scientific revolution that results in paradigm change is analogous to a political revolution. Political revolutions begin with a growing sense by members of the community that existing institutions have ceased adequately to meet the problems posed by an environment that they have in part created. The dissatisfaction with existing institutions is generally restricted to a segment of the political community. Political revolutions aim to change political institutions in ways that those institutions themselves prohibit. As the crisis deepens, individuals commit themselves to some concrete proposal for the reconstruction of society in a new institutional framework. Competing camps and parties form. One camp seeks to defend the old institutional constellation. One (or more) camps seek to institute a new political order. As polarisation occurs, political recourse fails. Parties to a revolutionary conflict finally resort to the techniques of mass persuasion."

AXIOM 2

Paradigms are incommensurable. you cannot "practice" two contradictory paradigms at the same time i.e. the world is both flat and a sphere.

Believing the world is flat leads to practices suited to a "flat world." Believing the world is non-complex (that is more like a clock than a forest) leads to practices suited to a world

that is like a clock. The two modes of being are "incommensurable." Kuhn explains:

"These examples point to the third and most fundamental aspect of the incommensurability of competing paradigms. In a sense that I am unable to explicate further, the proponents of competing paradigms practice their trades in different worlds. One contains constrained bodies that fall slowly, the other pendulums that repeat their motions again and again. In one, solutions are compounds, in the other mixtures. One is embedded in a flat, the other in a curved, matrix of space. Practicing in different worlds, the two groups of scientists see different things when they look from the same point in the same direction. Again, that is not to say that they can see anything they please. Both are looking at the world, and what they look at has not changed. But in some areas they see different things, and they see them in different relations one to the other. That is why a law that cannot even be demonstrated to one group of scientists may occasionally seem intuitively obvious to another."

SOURCE: "THE STRUCTURE OF SCIENTIFIC REVOLUTIONS", BY THOMAS KUHN

When we hear the question "If we can put a man on the moon, why can't we solve global hunger?" we are witnessing the crux of the problem in our dominant approach to complex social challenges. We act as if they are simply technical challenges, and it doesn't work. Complex challenges require a different approach than technical or non-complex challenges - one that is more adaptive and fluid.

AXIOM 3

Non-complex systems are always part of complex systems.

A non-complex system is one with a relatively consistent state to which simple rules apply, like a table for example.

Inevitably however, the table is part of a complex system around it - a dynamic space where things get moved around unpredictably, where fires can come and burn it, or humans can come and break it apart to repurpose it as a wendy house.

AXIOM 4

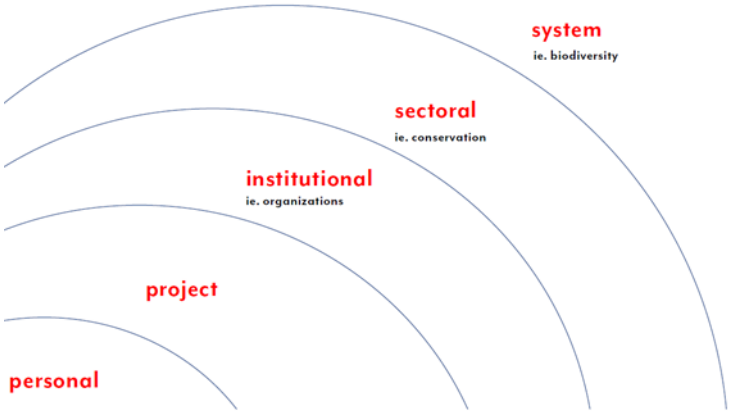
We adapt and learn our way into catastrophic failure by focusing on alleviating symptoms .

Failure is not something that just happens out of the blue, it is a creeping inevitability comprised of hundreds of maladaptive decisions and behaviours over time.

Things change around us but we do not change, and repeating the same failed responses over time leads to an overall catastrophe that we cannot come back from.

Catastrophic failure occurs when the demand for multiple forms of capital increases and our ability to supply that demand either decreases or remains constant.

Catastrophic failure can happen at any one of these levels:



Examples of systemic failure include:

- Worldwide renewable sources of freshwater per capita decreasing, as world population density rises leading to water shortages.

- The agricultural yield as a percentage of GDP in Yemen decreasing as the population increases, leading to famine.

- The number of hospital beds in the UK declining as the population of the UK increases- leading to shortages of hospital beds.

AXIOM 19

Linear processes don't exist in nature or elsewhere even though we like to pretend they do.

Our world is cyclical by nature, processes do not begin and then end at a finite point - never to begin again. We have learned that the only constant is change, and energy cannot be destroyed, it can only change form. Cause begets effect and so the world keeps turning and everything is different in each moment.

To imagine that there are static conditions under which we can act, and predictable outcomes to those actions, is to be comfortably and conveniently deluded. Acting on these imaginings is foolish at best, and dangerous at worst.

THE OXFORD DICTIONARY DEFINITION OF NON-LINEAR IS "NOT DENOTING, INVOLVING, OR ARRANGED IN A STRAIGHT LINE."

AXIOM 10

Effective practice in complex systems is reflexive & contextual best practice is an oxy-moron.

The practice of effective strategy is reflexive practice - adapting as the context changes.

Strategy is deeply sensitive to context. When the conditions under which we are working, and the information that we have available are constantly changing, the only "best practice" is reflexive practice.

As we act on a system we receive feedback and new information comes to light. We also change that system by our every interaction, and arguably it changes us.

As a result, emergent and reflexive practices that respond afresh to the needs of the moment, give us the best chance of keeping pace with a complex challenge.

AXIOM 11

The real innovation in complex systems are teams, not plans (the best teams are the product of reflexive practice).

For tackling complex challenges, multi-stakeholder teams bring the diversity of perspectives, skills, voices and resources necessary for an effective strategic response. As participants are drawn from multiple sectors, the culture of no single organisation or sector necessarily dominates. Team members have to negotiate a co-created culture of response. This obviously presents us with more unprecedented risks but it avoids the group-think and siloed responses of single-sector strategies.

Horizontal and Vertical Diversity

The composition of a team can determine the success or failure of an intervention in a complex challenge.

Start by bringing together diverse participants to work in a team that acts collectively. This participant pool must be horizontally diverse, meaning it is drawn from different sectors of society, such as government, civil society, and the business community.

In addition to horizontal diversity, effective teams are also characterized by vertical diversity, meaning they include people from all levels of power and institutional position from within the social system, from the leaders of large institutions to residents and those being directly impacted by the challenges being addressed.

Partnership with Stakeholders

The process of designing and testing prototype interventions or solutions to a complex social challenge should take place in genuine partnership with those who are affected by the outcomes, ensuring they have shared ownership (skin in the game - see Axiom 33) of any processes intended to affect them.

"Genuine partnership means 'no surprises' – partners are invited into the process as early as possible, they participate in the trial-and-error process, being exposed to mistakes that have been made in the past, as well as participating in the ongoing process of making mistakes. This requirement of genuine partnership is hard to meet. We are used to professional diversity, diversity that is "horizontal" that is, across disciplines. We are not as used to "vertical" diversity,

SOURCE: "THE RISE OF THE PROTOTYPING PARADIGM", BY ZAID HASSAN.

that is, diversity up and down various value chains. While we can imagine an architect working with an economist or political scientist, it's much, much harder for a clinician to work with a patient as peers. The capacities required to work with vertical diversity imply a tremendous sensitivity to power dynamics and the huge distortions caused by the most simple of differences. We are in general not trained to perceive and see these differences"

AXIOM 12

Effective strategy in complex systems is a practice – it's about what you actually do not what you might do.

"For studying courage in textbooks doesn't make you any more courageous than eating cow meat makes you bovine. By some mysterious mental mechanism, people fail to realize that the principal thing you can learn from a professor is how to be a professor—and the chief thing you can learn from, say, a life coach or inspirational speaker is how to become a life coach or inspirational speaker. So remember that the heroes of history were not classicists and library rats, those people who live vicariously in their texts. They were people of deeds and had to be endowed with the spirit of risk taking"

SOURCE: "SKIN IN THE GAME: HIDDEN ASYMMETRIES IN DAILY LIFE", BY NASSIM NICHOLAS TALEB.

Working with complexity is a practice, just like cooking is a practice. You only get good at it, by doing it.

Cooking as a practice includes the use of tools - frying pans, spatulas, processes - chopping, sautéing, spaces - usually a kitchen, or maybe a campfire, ingredients - vegetables, seasoning, and customs - traditional ways of preparing and serving the food.

Often people will come to the work of complexity expecting to be given tools. This is like believing you can cook because you have been given a frying pan, or read a recipe. It is only when you begin the practice of putting all these elements together that you can really be said to be cooking.

You might study cookery books for years, and still the first time you pick up your tools and begin cooking, you are likely to be bad at it.

Just as practice leads to improvement for individuals, the same is true of teams. A team of highly experienced, well-practiced and skillful football players coming together as a team for the very first

time are unlikely to win the world cup. Teams become more effective over time by practicing together.

JOURNALING QUESTIONS

- What is a complex challenge you are currently working on?
- What are your practices for doing this work and what do they reveal to you about the paradigms in which you operate?
- What examples of catastrophic failure have you witnessed in your work - at any level?
- Where do you find yourself acting as if things are linear or technical, that you now call into question?
- How can you make your own practices more reflexive or adaptive?
- Reflect on the teams you are a part of. In what ways could they become vertically and horizontally more diverse?

FURTHER READING + REFERENCES

- The Structure of Scientific Revolutions – Thomas Kuhn
- Melanie Mitchell, Complexity: A Guided Tour
- Drift Into Failure: From Hunting Broken Components to Understanding Complex Systems by Sidney Dekker
- Emergent Strategy - adrienne maree brown
- The Gigatonne Strategy - How can we reduce global emissions by one billion tonnes of CO_2e a year?
- Notes on a Strategic Vacuum - Zaid Hassan
- BAU Vs Complex Systems

2. INTRODUCTION TO EFFECTIVE STRATEGY

What is an effective strategy in situations of complexity? What does it mean to be more effective or less effective in situations like a global pandemic or climate change?

How can we tell the difference between effective strategy and bad strategy. How can we build more effective strategic responses to complex challenges. What's the role of story in effective strategy?

LEARNING OBJECTIVES

1. Understand the distinction between more effective/good strategies and ineffective/bad strategies
2. Understand the requirements for building more effective/good strategies
3. Understand the elements of effective/good strategy.
4. How to ground good strategy with a quantitative foundation
5. Understand what strategic failure looks like and how to manage risk

CORE CONCEPTS

WHAT IS STRATEGY?

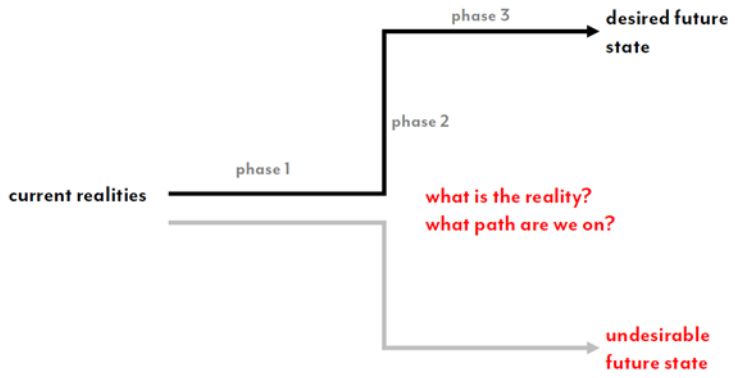
Strategy is the practice of getting from current realities to a desired future state.

If we think of strategy as a matter of getting people from one place to another - we can imagine there are many ways of doing this, many strategies we can take.

Generally strategies involving force or coercion are less effective and lead to less sustainable change, than strategies which result in people making a change or taking an action of their own volition - as a result of some choice or decision they have freely made.

STRATEGIC PLANNING

Strategic planning is the dominant practice for responding to complex challenges. It aims for optimisation as a strategy in situations of complexity. It looks at linear pathways from A to B - something like this:



The reality is we don't see the pathway as a whole when we are looking at a complex challenge. There is a lot about the terrain and the journey ahead that we cannot know when we set out.

We are socialised into a culture of strategic planning which is based on the fiction of a predictable journey. The characteristics of strategic plans are:

Predictive - they predict what will happen, in roughly what order, and when.

Objective - the people who write the plan cannot have a vested interest in the outcome.

Formalised - can be reduced to 2 dimensions e.g. a slide deck or spreadsheet.

Strategic planning can be considered malpractice when it comes to working with complexity. It is not fit for purpose.

Often we will invest huge resources in a strategic plan and continue to follow it when it becomes apparent that it is failing, because of the sunk costs already invested.

"More and more organizational leaders say they have a strategy, but they do not. Instead, they espouse what I call bad strategy. Bad strategy tends to skip over pesky details such as problems. It ignores the power of choice and focus, trying instead to accommodate a multitude of conflicting demands and interests. Like a quarterback whose only advice to teammates is "Let's win," bad strategy covers up its failure to guide by embracing the language of broad goals, ambition, vision, and values. Each of these elements is, of course, an important part of human life. But, by themselves, they are not substitutes for the hard work of strategy."

SOURCE: "GOOD STRATEGY, BAD STRATEGY: THE DIFFERENCE AND WHY IT MATTERS", BY RICHARD P. RUMEL

"Bad strategy is more than just the absence of good strategy. Bad strategy has a life and logic of its own, a false edifice built on mistaken foundations. Bad strategy may actively avoid analyzing obstacles because a leader believes that negative thoughts get in the way. Leaders may create bad strategy by mistakenly treating strategy work as an exercise in goal setting rather than problem solving. Or they may avoid hard choices because they do not wish to offend anyone—generating a bad strategy that tries to cover all the bases rather than focus resources and actions."

PROTOTYPING

Mohammad Yunus, the founder of Grameen Bank tells the following story,

"In 1976, I lent $ 27 to 42 people to help them get out of these unfair deals. People who received my money were very happy. Seeing how easy it was to make so many people so happy with such a small amount of money, I thought I should work out a way to find money for them on a permanent basis. So I went to the bank to arrange loans for them. Bank said they cannot give loans to the poor people because they are not creditworthy. So I thought I should take upon myself to find out whether their conclusion was right. I offered myself as a guarantor and took loans for the poor people. Tried some simple ways of handling these loans. They worked. Everybody paid back their loans. This triggered a whole series of experimentation - from one village to 5 villages, then to 20 villages, fifty villages, hundred villages. Every time it worked. But conventional banks did not want to change their minds. Finally, in 1983, we created a bank of our own. Now we work in 37,000 villages of Bangladesh. Bangladesh has a total of 68,000 villages. We now lend out to 2.2 million borrowers, 95 per cent of them are poor women. Our repayment rate has remained over 98 per cent." xxvi)

SOURCE: "THE RISE OF THE PROTOTYPING PARADIGM", BY ZAID HASSAN

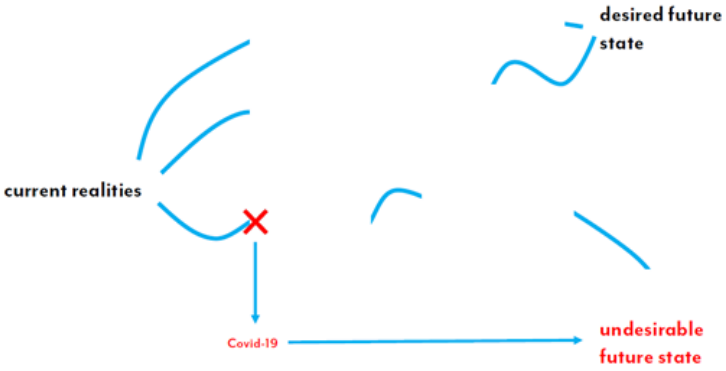
This story illustrates the nature of prototyping, at the heart of which sits trial and error.

Over the last decade we have seen an increase in the number and scale of prototyping responses. The prototyping process, when applied to complex social challenges, means running a prototyping programme, where multiple prototypes are run in parallel.

One way of understanding the function of this programme is to explore a promising solution space. Each prototype represents a line of enquiry that churns out data about how best to create value with regards to the complex challenge being faced.

AXIOM 6

There are multiple pathways for avoiding catastrophic failure, leading us to desirable future system states, but they are all emergent (unpredictable).



"Virtually everything that has been written about strategy making depicts it as a deliberate process. First we think, then we act. We formulate, then we implement. The progression seems so perfectly sensible. Why would anybody want to proceed differently? Our potter is in the studio, rolling the clay to make a waferlike sculpture. The clay sticks to the rolling pin, and a round form appears. Why not make a cylindrical vase? One idea leads to another, until a new pattern forms. Action has driven thinking: a strategy has emerged." Henry Mintzberg on 'Crafting Strategy'

All we can know about the future is that it is unpredictable.

We can set an intention to travel from A to B, but we cannot know for certain by what route we will get there. We may have planned to take a certain route, but cannot account for disruptions or diversions that may take us to our destination by some other path. Emergent strategy embraces this idea, and turns it into a deliberate approach. We create the path by walking it.

SOURCE: "CRAFTING STRATEGY", BY HENRY MINTZBERG

AXIOM 7

We cannot see very clearly into the future - we live in an era of the law of regression to the tail.

We live in a time governed by the law of "regression to the tail". This basically means that the "new normal" is one where events and circumstances are starting to get crazier than we can keep up with imagining:

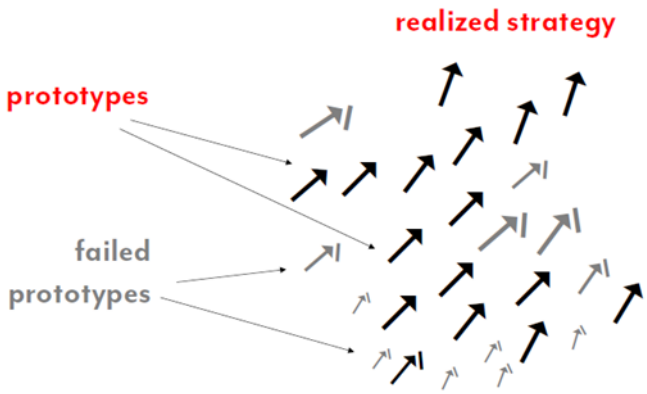
In a paper published in May 2020, Bent Flyvbjerg proposed:

"The law [of regression to the tail] depicts a situation with many extreme events, and no matter how extreme the most extreme event is, there will always be an event even more extreme than this. It is only a matter of time until it appears. I further suggest that regression to the tail is the new normal. We live in the age of regression to the tail. Tail risks are becoming increasingly important and common because of a more interconnected and fragile global system of human interaction for travel, commerce, finance, etc., but also because the walls are coming down between natural and human systems, with humans impacting nature at a global scale for the first time in history, not least in terms of climate change. The pandemic and the climate crisis are presently the two most significant manifestations of the law and age of regression to the tail."

SOURCE: "THE LAW OF REGRESSION TO THE TAIL: HOW TO SURVIVE COVID-19, THE CLIMATE CRISIS, AND OTHER DISASTERS", BY BENT FLYVBJERG.

AXIOM 8

Test as many pathways to desirable systems states as possible - the more we test, the more likely we are to find a way through



Prototyping as a method of problem solving requires a set of skills and attitudes that are very different to those demanded by traditional planning paradigms.

A successful prototyping programme is many times more effective than a comparable planning approach. Each prototype represents a small experiment, a small bet as to what a successful solution might look like. In a planning based approach we make one big bet, which typically either works or does not.

With a prototyping-based approach we are taking an approach of systemic spread betting – we lay down a number of small bets as to what a successful solution might look like. If we can run multiple, parallel prototypes then the probability of finding a solution that works goes up dramatically.

"Life is creative. It plays itself into existence, seeking out new relationships, new capacities, new traits. Life is an experiment to discover what's possible. As it tinkers with discovery, it creates more and more possibilities. With so much freedom for discovery how can life be anything but playful?"

- MARGARET J WHEATLEY AND MYRON KELLNER-ROGERS, A SIMPLER WAY

AXIOM 9

Be disciplined when testing in complex systems, draw boundaries (including temporal), be frugal in testing (jugaad innovation)

When prototyping interventions in a complex system, it is important to draw some boundaries and define the scope of your efforts. Doing so will increase the chance of creating tangible impacts and boost the credibility of and engagement with your work. You can do this by setting a challenge statement.

A challenge statement is an invitation, one that is compelling and inspires people to commit their time and energy to work on tackling the challenge.

Your challenge statement should name the problem you are seeking to address and for whom you are seeking to create benefit. A clear challenge statement aiming for a tangible impact that people can imagine and understand, builds the credibility of your work and encourages others to get behind it.

A good challenge statement helps to invite and mobilise a diverse group of stakeholders across sectors to work together. It can serve to bring together elements of a polarised system. Being specific about the challenge you want to address allows you to focus energy and resources to achieve tangible impact. You have a clear picture of what success looks like, and can motivate others to get the job done.

Start by asking these questions.

"Jugaad is a colloquial Hindi, Bengali, Marathi, Punjabi, Sindhi and Urdu word, which refers to a non-conventional, frugal innovation, often termed a "Hack". It could also refer to an innovative fix or a simple work-around, a solution that bends the rules, or a resource that can be used in such a way. It is also often used to signify creativity: to make existing things work, or to create new things with meager resources."

SOURCE: WIKIPEDIA

What is the problem? What situation are you trying to change or improve?

Who is affected by this problem and where are they? Who specifically are the demographic affected by this problem who you wish to help?

AXIOM 13

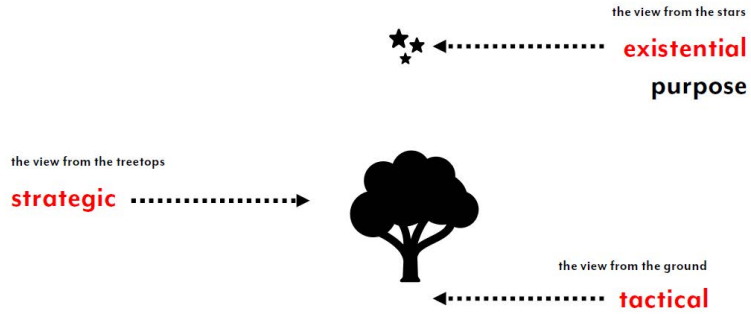
Effective strategy in complex systems is an infinite game not a finite game.

A complex challenge is by nature emergent and adaptive, and constantly generating new information. It is a non-linear process with no clear end point. Therefore approaching complex challenges as static, finite entities that can be comprehensively "solved" will certainly result in failure.

Working with complex challenges is to be in continuous reciprocal relationship with a system that is evolving and adapting before your very eyes.

AXIOM 14

In any complex system always take at least three perspectives – the existential, strategic & tactical.



Strategic - long term thinking, seeing the bigger picture

Tactical - short term thinking, seeing things in detail and close up, "in the weeds"

Existential - the view from the stars, meaning, bigger purpose

The existential perspective is where we locate purpose and vision e.g. "I want to live in a world free of poverty." This

might serve as an inspiration for action, but as an actual strategic objective it is ungrounded, unrealistic and vague. A true strategic objective will be based on more tangible impact.

SEE CHALLENGE STATEMENTS - AXIOM 9

AXIOM 15

Never privilege any one perspective over another – beware of your own bias (to one perspective over another).

We all absorb biases from the culture around us. Often these unexamined attitudes directly conflict with our values. Often these biases exist in unconscious awareness.

"The eye sees only what the mind is prepared to comprehend."

— ROBERTSON DAVIES, TEMPEST-TOST

A complex system by definition contains multitudes and we must make persistent effort to become cognisant of our biases and actively seek out multiple perspectives, particularly different perspectives from our own.

When working with complexity there is often a great deal of uncertainty to contend with. As we discussed in earlier axioms, large parts of the picture and the journey are unclear and changing rapidly, which can feel uncomfortable.

Under pressure of this discomfort, we can be inclined to retreat to the tactical level. Short term details are easier to predict, grasp and control, so we can find some comfort in busying ourselves here. The danger of this is we ignore the bigger picture.

The challenge when working with complexity is to find a way to hold the strategic, tactical, and existential perspective - paying attention to all three as we navigate.

AXIOM 16

There are always three critical places to intervene in any complex system existential = story, strategic = people, tactical = event.

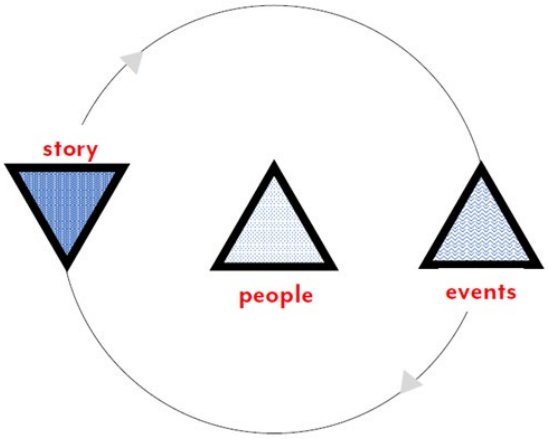
Intervening at the existential level in a complex challenge means changing the story. We are changing the beliefs, perceptions and narratives around an issue.

"Storytellers do not convert their listeners; they do not move them into the territory of a superior truth. Ignoring the issue of truth and falsehood altogether, they offer only vision. Storytelling is therefore not combative; it does not succeed or fail. A story cannot be obeyed. Instead of placing one body of knowledge against another, storytellers invite us to return from knowledge to thinking, from a bounded way of looking to an horizonal way of seeing."

- JAMES P. CARSE, FINITE AND INFINITE GAMES: A VISION OF LIFE AS PLAY AND POSSIBILITY

Intervening at the strategic level means changing people and what people do. This might look like getting people from a to b, moving people into changing the way people work together.

Intervening at the tactical level means changing events. This is where we cause something specific to happen or not happen. Somebody receives food, greenhouse gas emissions are prevented at source, an intervention is made and some tangible impact results.



AXIOM 17

Effective strategy in complexity requires mastering three practices simultaneously strategy-as-storytelling, strategy-as-action, strategy-as-inner game.

Strategy as storytelling - this happens at the existential level - we use story to inspire, engage and motivate stakeholders and other actors as part of our strategy. This is helping people to see what is possible, expanding vision to include new horizons, and inspiring people to take a journey with us.

Strategy as action - this happens at the tactical level - it is about what we do, our practices, the prototypes we design and test, the impact we have. This is about effective, iterative, reflexive practice and action.

Strategy as inner game - this happens at the strategic level - it is about how we perceive and respond to the bigger picture and all of the uncertainty that comes with this. Inner game is about building the inner capacities and resilience to work with the changing and unknowable nature of complex systems and also allowing ourselves to change with them.

JOURNALING QUESTIONS

- When and where have you witnessed or experienced the failure of strategic planning?
- Reflect on some powerful stories you have encountered in your life. What made them so powerful and how did they affect you?
- Which perspective are you most biased towards - existential, strategic or tactical? Think about some actual situations you find yourself in and what your natural response is? Have these been effective? If yes, why and if not, why.
- When and how do you "retreat to the tactical" under pressure?
- Reflect on a project you are working on - is your intervention at the strategic, tactical or existential level - or several or all of these? How do you know?

FURTHER READING + REFERENCES

- The Rise of The Prototyping Paradigm: Complex Social Challenges, The Impulse to Help,
- How It Fails and How It Can Succeed Again By Zaid Hassan, et al.
- Of Strategies, Deliberate and Emergent - Henry Mintzberg and James A. Waters
- Flyvbjerg, Bent, The Law of Regression to the Tail: How to Survive COVID-19, the Climate Crisis, and Other Disasters (May 13, 2020). Available at SSRN: https://ssrn.com/abstract=3600070
- Finite and Infinite Games: A Vision of Life as Play and Possibility - James P Carse
- A Simpler Way - Margaret J Wheatley and Myron Kellner-Rogers
- The Cognitive Style of PowerPoint- Edward Tufte
- Good Strategy, Bad Strategy: The Difference and why it Matters - Richard P. Rumel

3. INTRODUCTION TO MULTIPLE CAPITALS

One way of understanding complex challenges is through the lens of multiple capitals. Systems that are collapsing suffer from a situation where we are consuming more capital stocks than are being replenished.

The reality of working on complex challenges is that there is not enough financial capital to simply buy solutions.

For example in a situation where people are using more water than the replenishment rate of a natural aquifer, we cannot simply "buy" more water. In situations where people are leaving a city, we cannot simply reverse the brain-drain through paying people to stay or move in.

Therefore an effective strategy necessarily involves replenishing and rebuilding the base of capitals to tackle growing demand. The only way of doing this is through co-investment from multiple diverse stakeholders in a system.

LEARNING OBJECTIVES

1. Understanding complex systems through the lens of multiple capitals
2. Understanding how to correctly assess capital requirements for effective strategy
3. How do we assess the impact of our efforts to tackle a complex challenge?

AXIOMS

AXIOM 5

If demand is increasing and supply is constant or declining in a system, it is heading for catastrophic failure.

A simple example of this is right here in our bodies. If we run a marathon on a bowl of cereal, there quickly comes a point where our muscles are demanding fuel and the supply of that fuel is declining. Under these circumstances, we are likely to be headed for literal collapse.

On a societal level:

"Relationships among resources, capital, waste, and production form the basis for an ecological model of collapse in which production fails to meet maintenance requirements for existing capital. Societies facing such crises after having depleted essential resources risk catabolic collapse, a self-reinforcing cycle of contraction converting most capital to waste"

SOURCE: "HOW CIVILIZATIONS FALL: A THEORY OF CATABOLIC COLLAPSE", BY JOHN MICHAEL GREER

AXIOM 18

There are multiple forms of capital: financial, intellectual, physical, natural, social, human.

The six forms of capital we work with include:

- **Human Capital** or new capacities
- **Social Capital** or increased trust in the system
- **Intellectual Capital** or new knowledge and information
- **Physical Capital** or new products, services or infrastructure
- **Financial Capital** or new stocks (and flows) of financial capital
- **Natural Capital** or ecosystem services (such as trees or cleaner air)

AXIOM 20

In any healthy system inputs and outputs are balanced.

A simple example of an unhealthy system is our calorific intake in a day. If we take in too little, ultimately we starve. If we take in too much and we cannot use it all, ultimately we become sick.

Sustainability means "closing the loop" - meaning that all outputs are "recycled" to become "inputs" with minimal "waste". Our goal is to develop strategies with built in re-cycling or up-cycling mechanisms.

"Nothing in nature is disposable. Part of the resilience of nature is that nothing in nature is wasted. The earth swallows it all through mouths or soil or water. This is such a simple, beautiful truth. Everything is food, fuel, compost, a home for some other creature." - ADRIENNE MAREE BROWN, EMERGENT STRATEGY

"In the coming century, societies everywhere will be shaped by their strategic responses to the question of how they will meet their energy requirements. Nation-states seek to enter (or in some cases maintain) a cycle of surplus production. Capital is used to produce surplus capital, which in turn helps generate yet more capital (with waste as a byproduct of production). This process is a cycle of growth.

In recent history such cycles have been fed by fossil fuels, with a combination of public policy, private finance and technology providing the means of growth. On civilizational scales such cycles are known as anabolic cycles."

SOURCE: "NOTES ON A STRATEGIC VACUUM", BY ZAID HASSAN.

AXIOM 21

All complex organisms require energy, the more complex the more energy they need.

A human being requires a higher calorific intake than an amoeba. The system is more complex, and more energy is required as an input.

We have built high-growth complex societies with high energy needs.

"Our contemporary crisis is a function of the ability to generate enough energy to serve current and growing requirements of a Society. Energy, when usefully harnessed, is incorporated via energy flows into the idea of "capital" – defined as including "…physical capital such as food, fields, tools, and buildings; human capital such as laborers and scientists; social capital such as social hierarchies and economic systems; and information capital such as technical knowledge."

SOURCE: "NOTES ON A STRATEGIC VACUUM", BY ZAID HASSAN AND "HOW CIVILIZATIONS FAIL: A THEORY OF CATABOLIC COLLAPSE", BY JOHN MICHAEL GREER

Modern societies are dependent on energy. Our ability to produce new capital, for example, to feed ourselves, our ability to build infrastructure, our ability to create new products and services, our ability to respond to the challenges we face, are all a function of energy.

AXIOM 22

When societies grow too complex to maintain, they go through collapse going from complex to less complex.

Societies increase in complexity during periods of growth. Some examples of complexity in this instance are new infrastructure, new types of consumer goods or the growth of new service industries. Increasing complexity in society, also known as "development", requires increasing amounts of capital (physical, social, informational etc) in order to maintain systems.

The energy required to maintain complex societies, so called "maintenance energy," is higher than that of less complex societies. Societies can be ranked according to their energy intensity, the higher the energy intensity, the greater the maintenance energy required.

A change in society's ability to meet its maintenance energy requirements, for example from a drying up of liquidity, the

"Highland Park, Mich. — when the sun sets in this small city, its neighborhoods seem to vanish. In a deal to save money, two-thirds of the streetlights were yanked from the ground and hauled away this year, and the resulting darkness is a look that is familiar in the wide open cornfields of Iowa but not here, in a struggling community surrounded on nearly all sides by Detroit. Highland Park's circumstances are extreme; with financial woes so deep and long term, it has extinguished all but 500 streetlights in a city accustomed to 1,600, utility company officials say. But similar efforts have played out in dozens of towns and cities, like Myrtle Creek, Ore., Clintonville, Wis., Brainerd, Minn., Santa Rosa, Calif., and Rockford, Ill."

SOURCE: "DARKER NIGHTS AS SOME CITIES TURN OF THE LIGHTS", NEW YORK TIMES.

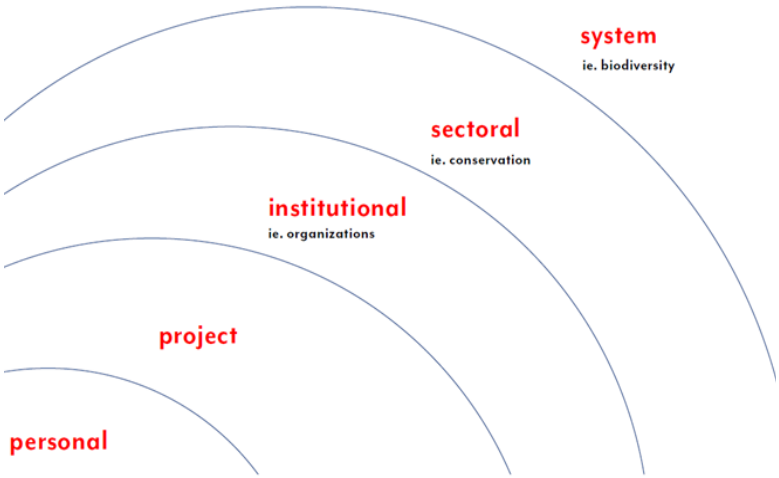
https://www.nytimes.com/2011/12/30/us/cities-cost-cuttings-leave-residents-in-the-dark.html

decline of natural resources, or an increase in the per-unit cost of energy, leads to a “maintenance crisis”. In a maintenance crisis, a society struggles to ensure that capital, in the form of physical capital, social capital and informational capital is not lost.

A number of societies that are high-consumers of energy, as well as a number of low-consumers, are currently experiencing such a maintenance crisis, which puts them into a cycle of decline. On civilizational scales such cycles are known as catabolic cycles. The timeframe for such declines are measured in decades and centuries.

This is called a “maintenance crisis” followed by “catabolic collapse”

SOURCE: NOTES ON A STRATEGIC VACUUM - ZAID HASSAN, AND HOW CIVILIZATIONS FAIL: A THEORY OF CATABOLIC COLLAPSE, JOHN MICHAEL GREER



Some parts of society have massive capital surpluses, while others have depreciating capital stocks. It isn’t a simple matter of redistribution, we are living “within” several systems that are constitutionally unhealthy i.e. in a maintenance crisis or collapsing.

AXIOM 23

Financial capital alone will never be sufficient to “buy” a way out of collapse there isn’t enough money to “buy” a solution.

The reality of working on complex challenges is that there is not enough financial capital to simply buy solutions.

For example in a situation where people are using more water than the replenishment rate of a natural aquifer, we

cannot simply “buy” more water. In situations where people are leaving a city, we cannot simply reverse the brain-drain through paying people to stay or move in.

For any at-scale response to a complex challenge to succeed, we must work on the assumption that it will require co-investment from multiple stakeholders. Co-investment in the form of both financial and non-financial forms of capital, with stakeholders investing their time (human capital), relationships (social capital), services and infrastructure (physical capital), data-sets, multiple forms of IP, and channels for data-dissemination (intellectual capital).

AXIOM 24

Tackling complex challenges require deliberate multiple capital strategies.

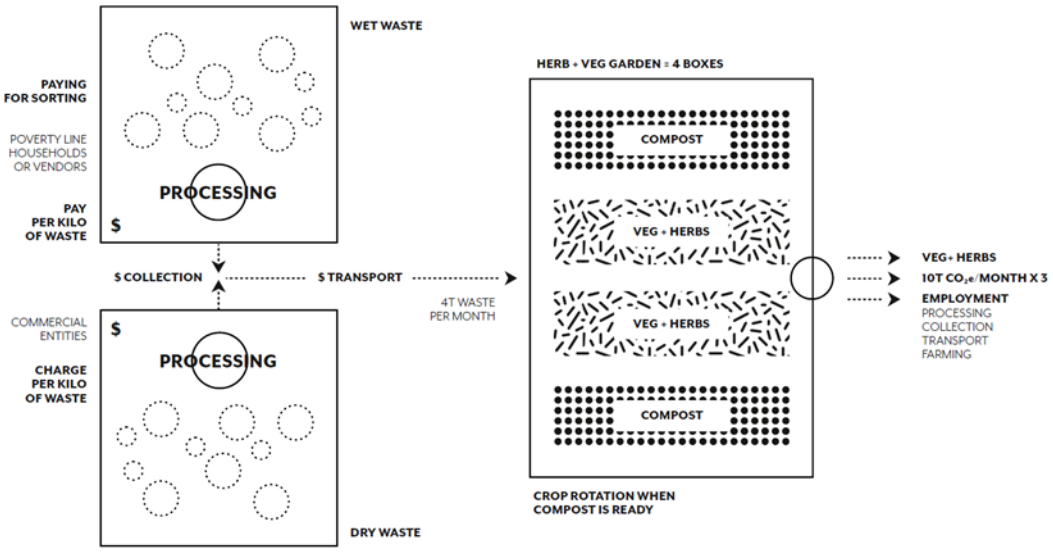
Our goal is to create multiple recycling and upcycling mechanisms within any solutions we implement in a situation of complexity.

When designing and testing an intervention in a complex system taking a multiple capitals approach, consider the following as a starting point:

- System - How much is needed? Who benefits? By what mechanisms?
- Inputs - how much do you need? How do you use it?How do you get it?
- Outputs - how much are you creating? How do you share it? Who decides?

As an example. A team from the Gigatonne Challenge is prototyping a “rapid food forest” as a CO_2e abatement prototype. Some of the inputs are waste cardboard, food waste, people’s time and energy, social capital and connections. Some of the output are emissions abatement, compost, food and employment.

SOURCE: GIGATONNE.ORG



The waste is collected from a range of sources. Low-income households and micro-businesses such as food stalls are paid for each kilo of sorted organic waste they provide.

Dry organic waste — such as cardboard and paper — is also collected from various sources including larger commercial businesses such as hotels or offices.

Transportation is provided by small businesses or individuals, who are subsidised to use cargo bicycles or electric vehicles, paid hourly. This creates local zero emissions logistics capacity in the form of small and micro-enterprises.

Organic waste is then composted in box gardens which are used to grow food and herbs. Gardeners and small-holder farmers are employed from the community to cultivate these gardens.

SOURCE: "QWAKANDA - A GIGATONNE TEAM", BY COMPLEXITY UNIVERSITY

AXIOM 25

Capital is a social relation between people, mediated by multiple instruments and tools.

"He discovered that capital is not a thing, but a social relation between persons, established by the instrumentality of things."
- KARL MARX

Adam Smith defined capital as "that part of man's stock which he expects to afford him revenue". This traditional view is that capital is something that we invest or input into some kind of production process or mechanism which then provides us with surplus capital as an output.

In our approach to complexity, we invite you to a revolution in our view of capital - to understand that capital is not simply an asset, but a relationship.

Relationships are not a form of capital, but capital is a relationship we enter into.

JOURNALING QUESTIONS

- When and where have you witnessed or experienced multiple capitals at play?
- What are some examples of complex systems that are facing a maintenance crisis?
- What are some examples of complex systems that are facing a surplus?
- Think of a complex system that you are a part of and jot down:

    - System - How much is needed? Who benefits? By what mechanisms?
    - Inputs - How much do you need? How do you use it? How do you get it?
    - Outputs - How much are you creating? How do you share it? Who decides?

- Do a multiple capitals audit for your current team / project and see where you have surplus and where you are deficient. What is the impact of this imbalance? What can you do to address this?

FURTHER READING + REFERENCES

- How Civilizations Fall: A Theory of Catabolic Collapse
  - John Michael Greer
- Towards a Theory of Systemic Action - Zaid Hassan
- To Hell with Good Intentions - Ivan Illich
- Philanthropy in an Era of Complexity - Terry Mazany and Zaid Hassan
- Six Capitals: The Revolution Capitalism Has to Have -or Can Accountants Save the Planet? - Jane Gleeson-White
- Qwakanda - A Level 3 Gigatonne Team - Complexity University

4. INTRODUCTION TO THE ARCHITECTURE OF COMPLEXITY

In this session we will explore how space, relationships and structures contribute to delivering effective strategy in situations of complexity. In the process, we will engage with questions of power, decision making, conflict, and co-creation.

We are all familiar with functions in organisations such as "human resources," "accounting and finance," "project management" and "marketing." In this session we will explore an alternative framing and structure for organisations working with complexity.

LEARNING OBJECTIVES

1. Understand the different kinds of spaces where strategy unfolds and the characteristics of those spaces.
2. Understand how different types of relationship contribute to or detract from effective strategic approaches to complexity.
3. Explore concepts of power and ownership as they relate to spaces and structures when working with complexity.
4. Reflect on the 'Inner Game' of complexity.

CORE CONCEPTS

SPACES IN WHICH DOMINANT RESPONSES TO COMPLEX CHALLENGES UNFOLD.

Our dominant responses to complex challenges operate four spaces within which all strategies must exist. These four spaces are:

Developmental - characterised as "safe", expert-led, technical, instrumental, programmatic, sub-system focus

Humanitarian -characterised by triage, event-based response, short-term, "supertanker", rapid, "6 ways to die" focus.

Security - characterised as covert, non-dialogic, tactical, accountability deficient, asymmetrical, invasive, governmental vs non-state.

Battle - characterised as chaotic, kinetic, destructive, expensive, unsafe, emergent, unaccountable, violent.

As development and humanitarian responses fail, we see the securitisation of humanitarian and development spaces.

Dominant responses to complex challenges reproduce the status quo through two types of relationships: helping and friend-enemy.

THE FOUR STACKS

Stack One: Innovation

The innovation stack is where "innovation" happens. Innovation can be thought of as "problem solving".

Stack Two: Information

A key characteristic of complex systems is information. Complex systems both generate and use information. Being able to successfully work with information is a core (and non-negotiable) requirement for an effective response to complexity.

Stack Three: Governance

The word "governance" is a catchall primarily concerned with decision-making. It refers to how decisions within a team or organisation are made. Who decides what where and when? If we were being technically accurate this stack can be thought of as being comprised of two stacks, "governance" and "facilitation." In a traditional system this could be thought of as "governance" and "management" or an "executive function".

Stack Four: Capacity

Many of the capacities required to respond effectively to complexity are new. Some capacities are specific to a particular context while others are common to all.

It is important to note that some of these stacks are not clearly delineated and overlapping. For example, governance without information is impossible. The final stack, capacity, is optional, as capacities could be built outside of your team or organisation.

AXIOM 26

Complex challenges are not owned by any one entity.

One of the difficulties with complex social challenges is that no one owns them.

This typically means that there is clearly no single entity with overall responsibility for addressing the challenge.

For example: The climate crisis is not in the hands of one particular organisation, government or community to solve. It is a challenge which involves multiple diverse stakeholders across the globe. The same could be said of structural racism, or gender inequity.

AXIOM 27

Effective strategy in complex systems unfolds in multiple spaces if there is sufficient space for emergence (the unplanned).

In spaces owned by a single owner, there is usually an insufficient degree of freedom for emergence. A space characterised by a single owner is more likely to be dominated by a habitual Business-As-Usual (BAU) response.

AXIOM 28

Effective strategy in complex systems requires the existence of negotiated spaces (not sovereign spaces).

The presence of multiple owners usually means that any space that is convened or created must be negotiated. The nature of the negotiation, of course depends on the strengths of the various parties involved and their skill in negotiating.

Even if each actor involved in the negotiation is habituated to a particular "BAU" space, the resultant negotiation is more likely to result in the creation of a hybrid space. Multiple owners coming from different sectors as opposed to a single sector helps create a negotiated space.

AXIOM 29

Effective strategy in complex systems always unfolds in contested spaces .

What does it mean to operate in contested terrain?

"In open confrontation, rationality yields to power."

- BENT FLYVBJERG, RATIONALITY AND POWER, PROPOSITION 8

The anthropologist Anna Lowenhaupt Tsing, in her study of Indonesian deforestation, makes the case that 'a wheel turns because of its encounter with the surface of a road; spinning in the air it goes nowhere. Rubbing two sticks together produces heat and light; one stick alone is just a stick. As a metaphorical image, friction reminds us that heterogeneous and unequal encounters can lead to new arrangements of culture and power'.

All too often BAU responses relegate contested voices to the outside as their contestation means they will not voluntarily participate in the plan. (Note that in many cases voices contesting a space refuse to enter it, lest they be co-opted.)

The practice of operating on contested terrain is to allow dissenting voices in.

This dissent serves in multiple ways. The most fundamental is that what is being contested, via dissent, is the shape of our society. Operating in contested terrain is also an antidote to groupthink. Groupthink can be understood as a situation in which a group of people who all think similarly come together, in our case for the purposes of addressing complex social challenges, but cannot come up with more than BAU responses.

"Every subordinate group creates a "hidden transcript" representing a critique of power, spoken behind the back of the dominant."

- JAMES C SCOTT, DOMINATION AND THE ARTS OF RESISTANCE.

The presence of diverse actors ensures that the probability of this is lower but consequently the propensity for conflict is higher than in an equivalent homogenous group.

An ineffective strategy can therefore be thought of as one that is frictionless, one within which wheels are spinning and energy is being burned but there is no forward movement.

Friction is a pre-requisite for movement. Unfortunately, most people are not well trained in coping with friction because at an interpersonal level it is uncomfortable. Why is it uncomfortable? Because BAU spaces characterised by command and control have evolved a professionalised culture where dissent is unwelcome. Dissenting voices, those speaking unpalatable truths that caused discomfort were generally viewed to be in bad taste. The unspoken threat being that people whose contributions were seen as unconstructive would not be invited back.

SOURCE: "TOWARDS A THEORY OF SYSTEMIC ACTION", BY ZAID HASSAN & "FRICTION", BY ANNA LOWENHAUPT TSING.

AXIOM 30

Creating new spaces, with sufficient degrees of freedom, is a non-negotiable requirement for responding effectively to any complex challenge.

"At the human scale, in order to create a world that works for more people, for more life, we have to collaborate on the process of dreaming and visioning and implementing that world. We have to recognize that a multitude of realities have, do and will exist."

- ADRIENNE MAREE BROWN, EMERGENT STRATEGY.

The use of space to shape relationships is a deliberate strategic response to complex challenges. Space can be used to free or it can be used to imprison.

Our goal is the deliberate co-creation of spaces designed to support effective strategic responses to complex challenges.

How do we design multiple heterodox spaces, not owned by any one entity, that support emergence? Questions to consider include:

- What are the qualities of space that support the unplanned?
- What is "allowed" inside such a space? What is not allowed?
- Who owns these spaces?
- What are the nature of relationships in these spaces?

AXIOM 31

The first requirement for tackling any complex challenge is to create space; find space, negotiate for space, or fight for space to operate in.

What is the function of space in complexity? When working with complexity it helps to break out of the box of seeing space as fixed, static.

Spaces, of course, are not just physical, they are also cognitive, emotional and increasingly virtual.

We can take an existential, strategic or tactical view of space.

- Existential - what is the social purpose of the space?
- Strategic - how do we get from the space we have, to the spaces we want?
- Tactical - what choices do we make in the design of space?

AXIOM 32

The original sin of complex systems is the belief that you can change systems without changing yourself.

"Transform yourself to transform the world."

- GRACE LEE BOGGS

Change in a complex system requires change within ourselves, because we are a part of the system, and the system is us. Recognizing a problem within a complex system also means recognizing yourself as a part of the issue and part of the solution.

Working with complexity means learning to cope with uncertainty, doubt and even failure. We need spaces to acknowledge the difficulty of taking risks in complex situations. We need spaces to be human.

The "inner game" of complexity requires us to reflect on and intentionally build the "muscles" for working with uncertainty, emergence, and conflict- both within a group or team, and within ourselves. A good degree of self-awareness and emotional intelligence is a key requirement for working effectively with complexity.

AXIOM 33

Nothing without skin in the game - if you don't have skin-in-the-game, you're unlikely to change anything.

"What matters isn't what a person has or doesn't have; it is what he or she is afraid of losing."

— NASSIM NICHOLAS TALEB, SKIN IN THE GAME: HIDDEN ASYMMETRIES IN DAILY LIFE

"When you have skin in the game, dull things like checking the safety of the aircraft because you may be forced to be a passenger in it cease to be boring. If you are an investor in a company, doing ultra-boring things like reading the footnotes of a financial statement (where the real information is to be found) becomes, well, almost not boring."

– Nassim Nicholas Taleb, Skin in the Game: Hidden Asymmetries in Daily Life

Skin in the game means we are invested in and impacted by the outcomes of the work we are doing.

When those involved in working on a complex challenge will remain wholly untouched by any outcome of their efforts, how can we expect the same level of commitment, effectiveness and motivation to effect real change?

JOURNALING QUESTIONS

- How might you make the spaces in which you operate more conducive to an effective response to complexity?

- How might the principles we have discussed around space be applied in virtual spaces?
- How do we design multiple heterodox spaces, not owned by any one entity, that support emergence? Questions to consider include:
    - → What are the qualities of space that support the unplanned?
    - → What is "allowed" inside such a space? What is not allowed?
    - → Who owns these spaces?
    - → What are the nature of relationships in these spaces?
- Whose presence and perspective is missing from your team, project or organization?
- What kind of qualities, capacities and practices do we need to cultivate resilience for working with complexity?

FURTHER READING + REFERENCES

- ❖ The Container Principle: The Wisdom of No Escape -Nova Scotia Sea School
- ❖ The Production of Space - Henri Lefebvre
- ❖ Skin in the Game: Hidden Asymmetries in Daily Life -Nassim Nicholas Taleb
- ❖ Trauma Stewardship: An Everyday Guide to Caring for Self while Caring for Others - Laura van Dernoot Lipsky with Connie Burk
- ❖ Governing the Common - Elinor Ostrom
- ❖ Seeing Like A State: How Certain Schemes to Improve the Human Condition Have Failed - James C Scott
- ❖ Friction - Anna Lowenhaupt Tsing