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SYSTEMS THINKING: THE ORGANISATION AS A LIVING SYSTEM

by

KATE MILLS

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SYNTHESIS*

MASTER OF ARTS

CRITICAL AND CREATIVE THINKING

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ABSTRACT

Systems thinking is a paradigm that challenges the dominant paradigm of linear, or mechanistic thinking. It is a paradigm based on the perspective that everything in a system is inter-connected and interrelated and that the interplay of components in the system creates an emergent quality with its own behaviour and characteristics. Systems thinking as such is suited to be used for analysis of organisations, as organisations can be seen as a system where the interplay of its components create emergent qualities such as the culture of the organisation. Within systems thinking there are living and non-living systems. Living systems, such as humans and nature, are in a state of non-equilibrium which they maintain by interacting with their environment. Living systems have certain principles, which can be observed in nature and should theoretically be applicable to other living systems, such as groups of humans working in organisations together. This paper proposes a model for applying four principles of living systems in an organisational setting. This is set in the context of how we construct knowledge and new models of thinking to create authentic ways of leading.

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Expose your mental models to the light of day (Meadows, 2008)

The glory is in strategy, but the honour is in implementation (author's own)

Introduction

This paper introduces systems thinking and living systems theory with a view to applying these theories within an organisation, or a group of humans brought together for a common purpose. Its particular focus is developing a model to apply living systems theory in the real world. Because a particular criticism of both systems thinking and living systems theory is that they seem to work best on paper but are incredibly difficult to lift into application.

For example, Donella Meadows' instructions for working with systems are to dance with them and come up with non-obvious and counter-intuitive ways to approach changing systems (Meadows, 2008). Otto Scharmer exhorts you to work from the emerging future and to 'let go' in order to 'let come' (Scharmer, 2009). Quantum physicist David Bohm tells you that you are simply a short-term physical manifestation of a great big unknown energy field he refers to as the 'implicate order' (Bohm, 2002). Margaret Wheatley asks that you consider the eddies and flows of the river and see if you can model your organisation on the gravitational flows of water as they head downstream to the sea (Wheatley, 2006).

This is all very poetic, but difficult to bring to the board table. At a strategy day I ran for my board, I planned for us to exit the building and take a walk at lunch time. Oh, the palaver of exiting and entering the building on a Saturday! 'A walk' they all chorused in surprise, raising their eyebrows. And yet the most memorable moment I have from that day, are two of the directors standing in a little garden, pointing something out on the skyline to each other. They were interacting and sharing an experience on a far deeper human level than anything else that happened the rest of that day.

But even outside of the boardroom it is challenging. One weekend on the coast with four of my close girlfriends, we lie on the beach like seals in the autumnal sun. We are trying

to build up enough warmth in our skin so that when we enter the sea, we can shriek about how cold the water is. It is a shallow beach, and you can swim out quite far and see the ocean floor. As we swim, we spy some islands of seagrass on the bottom. As we get closer to these islands, they lead us to an enormous forest of seagrass which stretches as far as we can see. I grew up on a very small, very windy island. On the island the trees were shaped by the prevailing winds from the Atlantic. They had no leaves, just branches, and they took the form of sculptures formed by the west wind. Seagrass is the same. You cannot see the ocean move any more than you can see the wind. But you can see how it moves in what it moves. Seagrass dances on the ocean floor. An uncountable number of blades move individually but as one in a seductive display of the ocean at work. In ancient times, rescued sailors would have spoken of this display as mermaid tresses, dancing to try and pull them deeper down. That day, I look at it and I see the power, beauty, and coherence of a living system. All weekend my friends have been asking me what my field of study is about, and I have struggled to explain it. Here, in the water, I point at the seagrass and say: "I want my organisation to be like this – beautiful and coherent". They stare back at me with incomprehension. No more queries about my field of study are forthcoming.

This field of study is esoteric to say the least. Yet on a deeply instinctive level it appeals to me. Humans working in groups is the most important work we can do. We cannot solve problems and create new ways of doing things on our own. We never have. The current pandemic is the absolute illustration of this – it is collaborative action that breeds results. And yet, we can be bad at working with each other. Groups of humans are frankly baffling. They come together for a purpose, but nearly always create unintended consequences. People do not want to work in toxic environments, but organisations can be rife with toxicity. Many of us feel no connection with the work we do and a larger purpose. A lot of the time groups do not achieve what they set out to do. I work in youth homelessness and as a community we

spend millions of dollars and hours every year on trying to reduce it. Yet every year the number of young people without safe and secure accommodation increases. How is it getting worse, when so many of us want to make it better?

The answer, I think, is to ask what could we learn from bigger - and potentially wiser - living systems? Humans are – as I will show – living systems. We are part of the bigger living system which we refer to as nature. What if we took the time to study those larger living systems and apply what we see in our own organisations? How can I take the qualities of the seagrass as a living system, and apply it to my organisation, which is also a living system? In this paper nature is my lodestar. I might gently mock when Margaret Wheatley asks directly: "What is it that streams can teach me about organisations?' (Wheatley, 2006), but really, I am envious of her bravery. I too want to look to the forests, lakes, and mountains for guidance. I want to take what I learn there and bring it into my organisation. My work is to build a bridge between the two.

There are two points I want to make to the reader here to give them an overarching orientation for this paper. The two quotes I have at the beginning of this paper are the two arrows that drive its direction.

Donella Meadows is renowned for her work on systems thinking and her book, 'Thinking in Systems' (Meadows, 2008), is full of wisdom. The one thing that really resonated with me with regards to this paper, is her advice to 'expose your mental models to the light of day. She writes: 'When we draw structural diagrams and then write equations, we are forced to make our assumptions visible and to express them with rigour.' You will see that I have attempted to make my thinking visible in this paper through my drawings. In truth, I keep a lot of my thinking close to my chest. I am scared that people will not understand me and that I will look silly. I find that drawing them out helps me to share them and that Meadows is right, it does give them a rigour.

To that end, the below model is to show you the bigger context for this work and why I am doing it. I have a theory I refer to as 'right person/organisation' / 'right space-time' / 'right action'. It is an old theory – we all know the concept of being the right person at the right time to explain why things happen for people. But think of this as a directional tool, something that you use as a creative tool for yourself and for the impact that you can have. Can you be a 'right' person in that you constantly work to understand yourself, your values, and your skills? Can you understand the broader eco-system that you are in so you can manoeuvre yourself to be in the right space-time? And then, once there, do you know what the right thing to do would be?

Then look at where you want to be on a problem-solving or 'having-impact' line. I want to be upstream, closer to the source. For example, at my organisation we build homes for homeless youth. It is very laudable and is an action that must take place, but it does not reduce homelessness at all. In fact, in my darker moments, I think that building homes for homeless youth almost creates demand for the homes we build. It does not sound like it makes sense, that by building bedrooms I am contributing to homelessness, but systems thinking does get you looking at how we build systems that perpetuate, through doing what looks like right actions but are actually wrong actions. There are new methodologies that are reducing homelessness such as Built to Zero (Built For Zero, n.d.) and I want to work there instead, closer to the source.

The model looks like this. (Where RP/O refers to right person/organisation, RA refers to right action and RS-T refers to right space-time).
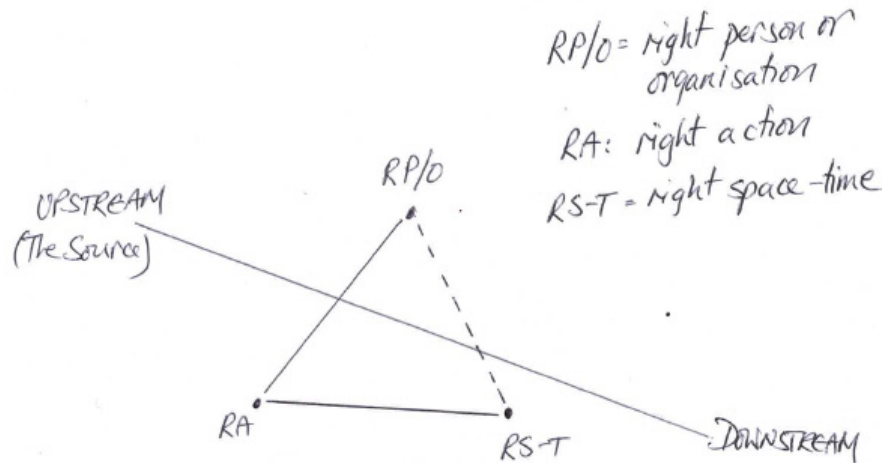
Figure 1: right person/organisation / right space-time / right action

If this model is akin to anything, then it is to Peter Senge's model of creative tension (Senge, 1990), where the vision of what you want to be (the creative vision) is in tension with where we currently are (reality). Senge put the two at opposite ends of a rubber band, creating a tension that must be resolved one way or another. The question is, can you use that tension to move from where you currently are to where you want to be. My model has a similar goal – can you use it to move to where you want to be?

Figure 2: Peter Senge's model of creative tension

A note here to my readers. For this paper, I focused on reading one major work from each of the major authors in these fields. This means that I read Senge's 'The Fifth Discipline' (Senge, 1990) in full. I also read 'Thinking in Systems' (Meadows, 2008), David Bohm's 'On Dialogue' (Bohm, 1996) and 'Wholeness and The Implicate Order' (Bohm,

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2002) as well as Margaret Wheatley's 'Leadership and the New Science' (Wheatley, 2006), Otto Scharmer's 'Theory U' (Scharmer, 2009) and Fritjof Capra and Pier Luigi Luisi's 'The Systems View of Life' (Capra & Luisi, 2014) in their entirety. I am sharing this to give the reader a view of my research approach as well as to give context to the relatively short bibliography for a paper of this size. I took this approach because I wanted a deep and broad understanding of their main ideas.

Then I have one of my own aphorisms. Born from countless hours of sitting in strategy sessions and then seeing how difficult it is to implement strategy, I often say how the glory is in strategy, but the honour is in implementation. Most strategists do not have to implement what they come up with. It can be an arcane art, where strategists come up with what looks good on paper (much like some living systems theorists) and are praised for coming up with things that can be intellectually brilliant. But getting the model off the paper and getting humans to use it is a very different skill. I like strategy because it suits my thinking skills. I find implementation hard-going, full of one-step-forward and two-steps-back. But I always remember this: "The credit belongs to the man who is actually in the arena," (Roosevelt, 1910).

So, let us now go forth and see if we can get into the arena, armed with principles that come from forests, lakes, and mountains.

Section 1: An introduction to systems thinking

Systems thinking is a paradigm that asks us to look at the whole, rather than focus on the parts. In Senge's work it is the 'fifth discipline', the discipline that integrates his other four disciplines of shared vision, mental models, team learning, and personal mastery (Senge, 1990).

When we stand back and look at the whole with a systems thinking lens, we see that there is a behaviour or quality that exclusively belongs to the whole. That behaviour or quality is brought about by the interaction of the parts but cannot be attributed to any one of the parts. This is considered the emergent quality of the system.

Think of it like this. In my house we have breakfast together a few mornings a week. I might make pancakes if we have leftover bananas, and my children will set the table while my husband makes the coffee. Then we sit and have an extremely convivial time. We talk, we laugh, there is a quality to the experience, a feeling in the room of happiness and connection that cannot be explained by any of the individual parts – my family, the banana pancakes, the set table, or the coffee. These are the parts that are absolutely necessary to having breakfast and the happy experience that comes with it. Without any one of these, the happy experience – which is the whole and the totality of having breakfast together - would not be achieved. And yet the happy feeling cannot be linked to any one of the parts, it is the interaction of the parts that creates the quality of the emotion and the experience around the breakfast table. That feeling is the system at work, the constituent parts have come into play and an emergent quality is perceived – in this case the feeling that emerges in the room from the interplay of the different parts – the banana pancakes, the coffee, and the welcoming table etc.

Systems thinker and organisational theorist, Russell Ackoff, gave a more concrete example when he spoke of how the emergent quality of a car – its ability to transport you from one place to another – is a result of the whole and cannot be attributed to any one part. The wheels on their own will not transport you. The seat may be comfortable, but on its own you are going nowhere. By itself, the steering wheel is probably best used as a frisbee – it will not get you to where you want to get to go. But put them all together and turn the car on and hey presto – off we go! "If we were to disassemble a car, even if we kept every single

piece, we would no longer have a car. Why? Because the automobile is not the sum of its parts, it is the product of their interactions" (Ackoff & Wardman, n.d.).

Hold these two examples – the convivial breakfast and the car – in your head for a moment. One is a living system and the other a non-living or inanimate system and we will focus more on living systems in this paper.

Systems thinking emerged in the last century as a response to hundreds of years of mechanistic thinking. This held that all knowledge was achievable through analysis and by breaking things down to their component parts. French philosopher Rene Descartes in the 17th century was famous for breaking the human down into component parts – the mind and the body which he saw as separate.

Descartes rational approach to knowledge was a forerunner to the dominant philosophy that the world could be broken down into component parts and each part could be studied. It was as though the whole world was a clock and that the study of its independent parts would explain how the whole thing worked.

Systems thinking was then established as a discipline in the 20th century. Karl Ludwig Von Bertalanffy was an Austrian biologist who positioned it as an interdisciplinary practice drawing on the fields of science, art, and philosophy (Bertalanffy, 1968). Bertalanffy's insight was that the component parts are not independent, they are interrelated and inter-connected and from that, the parts create a system with its own characteristics.

A brief overview of the different ways of thinking would look like this:

Systems Thinking	Mechanistic Thinking
Not everything is known	Everything can be explained
Synthesis (the whole)	Analysis (the parts)
Look for patterns (connection)	Look for cause (linear)

Mechanistic thinking remains the dominant mode for thinking and there are good reasons for that. Much of the world we live in is linear. If you are hungry, you should eat. If you push someone, they fall over. Most of our daily interactions and problem-solving respond perfectly well to linear thinking. Systems thinking is more complex, and you only need to use it when the situation calls for it.

Michael Goodman (Goodman, 1997) gives a set of guidelines as to when systems thinking might be useful. This is when a problem is ongoing, chronic, and familiar which people have unsuccessfully tried to solve before.

While linear thinking is dominant, I believe that systems thinking is needed more than ever. That is because of the ever-increasing number of components in play in our world. We produce more, there are more humans than ever before, we know more than we ever have – we are hurtling in the direction of more for everything. With more components, linear connections need to be almost exponential to explain connections. Systems thinking allows us to step back and look at the whole, rather than jumping from component to component to explain links.

Also, while a general theory of systems thinking was established in the last century, it is not an entirely new way of thinking. We find fragments of systems thinking throughout history. It is to Aristotle that the phrase 'the whole is bigger than the sum of its parts' is attributed. This phrase indicates an understanding that something extra is in play when parts are brought together. Leonardi da Vinci told us that everything is connected back in the 15th century, and it is perhaps no surprise that da Vinci exemplified an inter-disciplinary life.

Donella Meadows (Meadows, 2008) gives a good framework to use when thinking of systems. She gives a guide to seeing a system in four parts:

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1. A system is a set of things – people, cells, molecules, automobile parts, etc.

2. The things are all interconnected to each other either directly or indirectly.

3. That interconnection produces a pattern of behaviour or a quality. This is the emergent quality, it cannot be produced by one part of the system, it is produced by the interaction of the parts.

4. The emergent quality cannot be grasped on its own, it can only be fostered by an appreciation of the individual parts and the whole.

So, systems thinking directs us to look at the whole, to understand the complexity of the system, rather than focusing only on a direct linear relationship. We are used to working with linear concepts, where when we do the action 'A', we get the result 'B'. For example, I keep being late to work and I say to my spouse it is because we do not have a clock. My spouse very kindly buys a clock for our bedroom (intervention A) so I know what the time is and can get to work on time (result B).
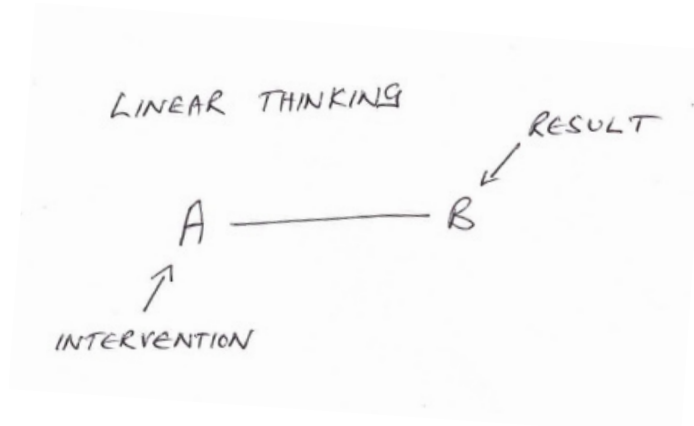

Figure 3: Linear thinking

In linear thinking we do know that there are other components, but we do not think that they are connected. So, as well as 'A' and 'B', there is also 'C', 'D', 'E' and 'F'. These

components relate to other elements like the weather, my route to work, my colleagues, etc.

that are part of my day as I get to work, but linear thinking does not connect these.
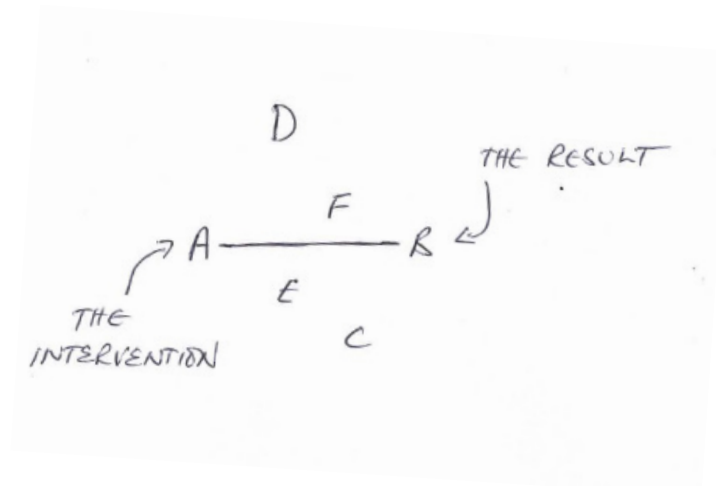
Figure 4: Other components of linear thinking

Systems thinking challenges this idea. It says that all components are interconnected

in some way. 'A' and 'B' cannot interact in isolation and there is not only that direct

relationship. It might be that when you do action 'A' you get 'B', but if you are operating in a

system there are other results that could also occur. Everything in a system is interconnected

so now 'A' and 'B' are not operating in isolation. Instead, there are relationships with 'C',

'D', 'E', and 'F' as well. Now every component is inter-connected, either directly or

Figure 5: Everything in the system is interconnected

indirectly. And, as the model shows the connections go both ways. While 'A' is connected to 'B', vice-versa is also true and this runs through all components in the model. One thing I note is that if we see relationships between everything how much more energy there is. When we note all that energy, perhaps it will help us to understand how the emergent quality of the
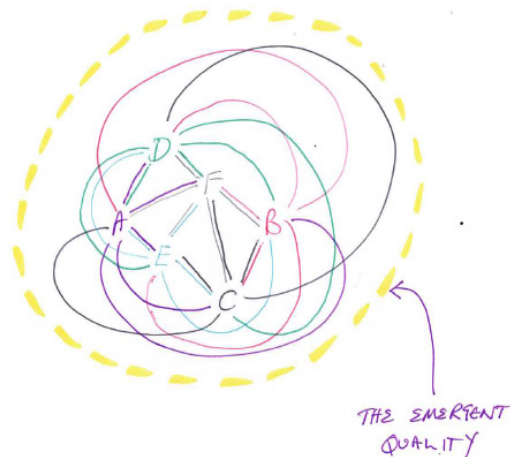
Figure 6: The emergent quality is created
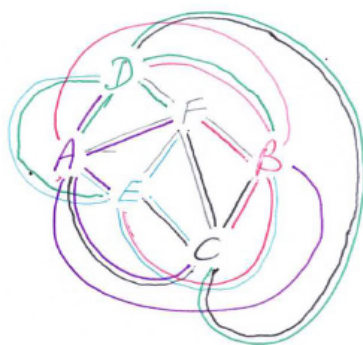
system comes into being. Think about how all these connections create an energy that effectively gives 'life' to the system in the form of an emergent quality that has its own behaviour.

Now action 'A' has an impact on 'C', 'D', 'E', and 'F' as well, putting us in the land of unintended consequences. Or it may be that doing action 'A' results in 'C' when really you wanted the result of 'B', putting us in the land where nothing works out quite the way that we intended! There is also the impact and influence of the emergent quality to also consider.

So, the 'tick-tock' of the clock keeps me awake at night and instead of being on time for work, I am late. Or the clock creates an ever-present awareness of time passing and makes me stressed. While I get to work on time, I am less productive because of this stress. It turns out, there is quite a complicated relationship between me, the clock, time, and work.

The key with systems thinking is to see there is a potentially broader invisible context to everything. This system needs to be seen and appreciated to get the results that we want. Bringing in the clock has not solved the problem of me getting to work on time, in fact it has either made me late or less productive. Perhaps the real problem is that I do not like my colleagues, which is why I keep getting in late to work so I can spend less time in their company. If I want to get to work on time, perhaps I need to change jobs? An appreciation of the complexity of the whole leads us to look for different intervention points to get the desired result.

Now, when we look at the diagram we need to ask – where in the system should I intervene to get the result that I want? If what I want is to get to work on time, what else needs to be considered beyond getting a clock?

Systems thinkers look at A to F and refer to them as leverage points. These points are the holy grail in systems thinking – touch the right one, even lightly, and you should in theory be able to effect change on the system in the way that you want. Of course, it is really difficult to know which one to play with, or how hard to apply pressure.

My field of interest is organisational theory and I think that systems thinking is a good lens to use with an organisation because organisations exemplify the birth of emergent qualities. While organisations are made up of people, the organisation has its own separate characteristics, culture and behaviour that is independent of any one person in that organisation.

It is tempting to think that an organisation is ruled by its chief executive officer, but many a CEO has come to ruin by trying to direct an organisation to do something and then watch the organisation fail to respond to directions.

Finally, I like to think of the system as everything that exists between what you can see. It is tempting to think that because you cannot see what lives in this 'unseen-in-between',

there is nothing there. But everything you see stands in relation to everything else you see. Think of those invisible interrelationships as forming a complex web that (a) lies between everything that you see and (b) has its own characteristics.

We sometimes hear this complex thick web of invisible strings as being referred to as 'fields' and this might be a better way to understand them.

Says Wheatley: 'We now sense that some of the best ways to create continuity and congruence in the midst of turbulent times are through the use not of controls, but of forces that are invisible yet palpable. Many scientists now work with the concepts of fields – invisible forces that occupy space and influence behaviour' (Wheatley, 2006).

Wheatley refers to these fields as able to 'encourage us to think of a universe that more closely resembles an ocean, filled with interpenetrating influences and invisible forces that connect. This is much richer portrait of the universe; in the field world, there are potentials for influence everywhere.'

I am back swimming across the seagrass. There are invisible, complex webs that lie between everything that you see and know. Emergent, new, and unique qualities that arise from the interplay of all parts of a system. Mystical leverage points. The idea that 'there are potentials for influence everywhere'. These are huge ideas and as I researched them, I often complained that my small brain was indeed not large enough to take them in. If one truly believes in the 'unseen-in-between' then stop to think how large that field is, when compared to the objects that you can see and touch. How small the known world becomes.

So, start small in systems theory. It is overwhelming to look at the whole and it is why we struggle with changing large systems such as the political system. Truly seeing the complexity of a system can make us want to pack up our bags and go home. So, look around you in your home or your work or your social scene and identify a system that is not overwhelmingly complex and see if you can play with it.

One final point. Remember, linear thinking has plenty of good uses – always think if you can solve something with linear thinking first.

Then, if you think that systems thinking is a useful way of seeing things, you can use it. But bear in mind that systems do not just exist on paper and cannot be squeezed into diagrams or sometimes even described with language because of their 'unseen-in between' nature. Sometimes you just must play and experiment with systems to see what works. As Meadows says: "We can't control systems or figure them out. But we can dance with them!"

(I would note this to be typical of the often maddeningly abstruse instructions and advice given in systems thinking. I would be happy to dance with a system, but what am I trying out here, the waltz or the two-step?)

The best tool I think to use with system thinking is action research where we work through a process of evaluation, planning and proposing to implementation and reflection. That is what I am going to try here in this paper with regards to my organisation.

Section 2: Overview of the Property Industry Foundation

This work is grounded in the organisation that I work for – The Property Industry Foundation. To give the reader some context I have included some background information on the Foundation and how it works.

I work as the CEO of a charity called the Property Industry Foundation. It was set up 25 years ago by leaders in the property industry, to bring the industry together to have an impact on youth homelessness.

I joined 2 years ago, and our current strategy is to increase the number of bedrooms available for homeless youth to have a safe and secure night. We are not ourselves a frontline charity that deals with homeless youth. We build for those frontline charities and then we

move on to the next project. Our sweet spot is building 6-bedroom care homes, where there will be 5 homeless youth and a full-time carer.

Our point of difference is that we build with a 50-50 model. For example, it costs $500,000 to build a 5-bedroom house. We fundraise the full amount and underwrite each build. We then ask builders to partner with us on a pro bono basis and typically that means we deliver the house for 50% cash and 50% in-kind/pro bono goods and services. So, a $500,000 house ends up costing us $250,000 and then we can throw forward the remaining $250,000 to the next project.

We have around 10 employees across Sydney, Melbourne, and Brisbane. We have about 100 serious volunteers that work on one of our committees or help us in other ways. Then we have a market of several hundred thousand in terms of people that are in the industry that could support us. Below is an image of how to see the organisation is at the centre of connected groups. The ten employees are the kernel group, then we have our 100 serious volunteers, then our donors and supporters.
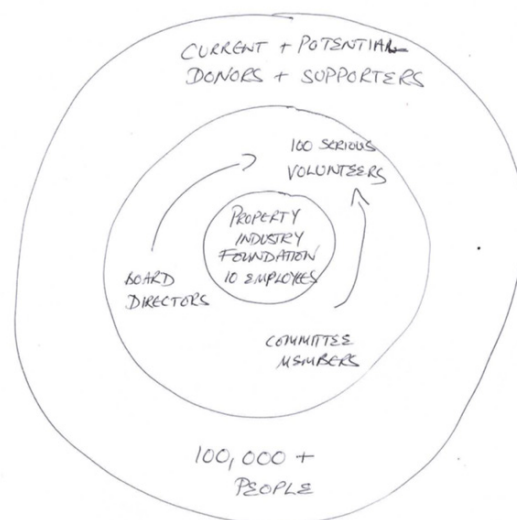
Figure 7: The Property Industry Foundation

We can also step back and see the larger picture of where we are in the broader system of youth homelessness.

Figure 8: The system of youth homelessness

Here you see we are only one small part of a much bigger system. The influence I have in this bigger system is the leverage point of the Foundation. I have a three-point question I ask myself when considering strategy which relates to my earlier 3-point model of a directional tool to drive yourself upstream.

- The first is, are we correctly resourced as an organisation? This relates to how we well we understand both the broader picture and what we can best do with the skills and means that we have. This is about being the 'right' organisation.

- Then, are we in the right place and time in that broader picture? This relates to where our activities are focused. We typically build transition accommodation for youth between 13 and 22 – these are young people that cannot live at home primarily because of domestic violence. It is valid to ask if perhaps we should build better homes for families under stress, to play a part in creating environments that lessen domestic violence.

- Finally, are we doing the right actions? Our response to youth homelessness is to build more houses. However, there is debate as to whether building more homes treats the symptom, but not the cause. It is broadly accepted that you cannot build your way out of youth homelessness, because for every youth you house, another one appears.

I am looking to answer and explore these questions by putting the above principles of living systems into practice in my organisation. Putting them into practice is unchartered territory. It is easy to find literature that elucidates the principles, it is harder to find guidance for how to make them work.

But what use is all this theory and thinking if you cannot put it into practice? Remember, the glory is in strategy, but the honour is in implementation.

Section 3: Living Systems

Within the study of systems thinking, there are living systems and non-living systems. A non-living system is Russell Ackoff's automobile or a chair, for example, or any non-animate object. A car is made up of component parts none of which on their own will allow you to go from one place to another. However, once the component parts are assembled the car is now something you can drive to get around. Its ability to transport you is its emergent

quality – a quality that is due to the interplay of the parts but cannot be attributed to any one part and has its own character. It moves when you move it, but without external input, it is non-animate and in a state of equilibrium. (I note that these definitions are being challenged by artificial intelligence which may require us to re-define what is living and non-living, but I think it still holds for now).
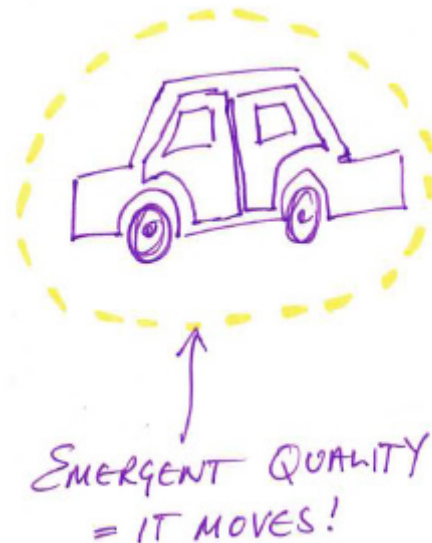
Figure 9: The emergent quality of a car

Living systems, on the other hand, are animate and in a constant state of non-equilibrium which they maintain by interacting with their larger environment. A human being is a prime example of a living system. Humans have many different components such as internal organs, limbs, and skin, but it is the interaction of these components that gives rise to a system with a distinct emergent quality – that of life.

Authors Humberto Maturana and Francisco Varela came up with the definition for living systems as being autopoietic – that is they are autonomous, self-referring, and self-constructing closed systems (Manturana & Varela, 1980).

A living system can maintain and renew itself through self-regulation and a conservation of its own boundaries. A human being is always human, it maintains itself and does not become something else. Similarly, a human being is constantly renewing itself at a cellular level throughout its life. Fritjof Capra and Pier Luigi Luisi in The Systems View of Life: A Unifying Vision (Capra & Luisi, 2014) say: "A yeast cell remains a yeast cell…the cell's main function is to maintain its own individuality despite the myriad of chemical transformations taking place in it' and that: 'Life is a factory that makes itself from within'.

Figure 10: Life as the emergent quality in living systems

The emergent quality of life in living systems does not have a specific location. Think of yourself. You are alive in your body, but where exactly in your body is life? "Life is not localised; life is a global property, arising from the collective interactions of the molecular species in the cell', (Capra & Luisi, 2014).

Autopoiesis is the central defining factor of living systems, but authors such as Capra, Luigi, and Wheatley among others have put forward other principles of living systems. Four

of these proposed principles will be discussed in this section, and then dealt with in more detail within an organisational context.

These authors have used the classical sciences to develop these principles; by which I mean they are derived from the study of biology, chemistry, and physics, and often use the language of mathematics. This makes the study of living systems complex; reading the literature one might feel as though you need to understand non-linear mathematics and quantum physics to pierce the veil of living systems.

However, one approach to living systems is to observe the over-arching living system that we live in, that of nature. We instinctively understand that nature is a living system, and we get an inkling from our school biology lessons of how everything in nature is inter-connected and can see the emergent quality of life in nature.

Years ago, I walked into a gallery in Cornwall in England. There was a huge picture on the wall that was a study of pebbles in a stream surrounded by moss. It caught my eye and as I studied it, I realised that I did not know whether it was a close-up study of pebbles in a stream, or a much larger image of hills beside rivers, covered by trees. Was the artist close up to the earth with a magnifying glass, or far away, looking down from a plane?

What I saw in that image was a fractal, a complex pattern that is similar and related at similar scales everywhere in nature. Says Capra: "The most striking property of these fractal shapes is that their characteristic patterns are found repeatedly at descending scales, so that their parts, at any scale, are similar in shapes to the whole." So "rocks on mountains look like small mountains, branches of lightning, or borders of clouds, repeat the same pattern again and again; coastlines divide into smaller and smaller portions, each showing similar arrangements of beaches and headlands."

Self-similarity, mimicry, and patterns is a principle of living systems. It has a very complex mathematical equation sitting alongside it which was pioneered by the

mathematician Benoit Mandelbrot (1924-2010). However, you do not need to study this to understand this principle, you just need to keep your eyes open and look around you. And perhaps be open to action when you see something: It is a gentle regret that I did not buy that picture in that gallery. In that moment I knew what I was seeing, but at the same time I did not know what it was. Or as T.S. Eliot (Eliot, 1943) reminds us: "We shall not cease from exploration, and the end of all our exploring will be to arrive where we started and know the place for the first time".

In reading all the literature I kept this image in my head and indeed Capra goes back time and time again to nature and biology to look at the patterns that can be seen at the most minute levels in nature. From these he extrapolates larger principles which I expand on below. In this work I am positioning that organisations – or any grouping of humans – can be seen as a living system. When we see a flock of birds flying together, we can almost see them as one huge living system, made up of individual birds. So, it is possible to also see humans as one connected living system.
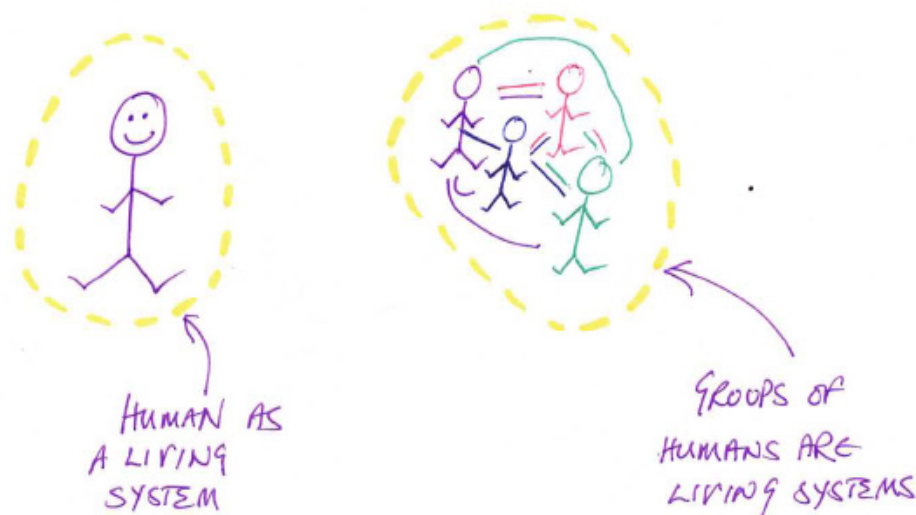

Figure 11: Groups of humans are living systems

According to Capra the lens of living systems is an important one for social structures like groups and organisations. It is an important insight "that social networks exhibit the same general principles as biological networks…the observation that the "bio=logic" or pattern of organisation of simple cell is the same as an entire social structure is nontrivial. It suggests a fundamental unity of life, and hence also the need to study and understand all living structures from such a unifying perspective."

This has a particular application in organizational theory, where humans work together for specific outcomes. Organisations are bound systems. They have a shared meaning, pursue set objectives, and have rules in terms of how the organisation and the people in it can behave.

There is already a significant body of literature that looks at how organisations can be viewed through the living system lens, and this work looks at how to apply the specific principles above within an organisational setting. Note that I too am trying – by using these principles – to use mimicry by taking what I see in a large living system such as nature and trying to implement them in the living system of my organisation. I want to set up a wheel within a wheel and access a potential underlying order in living systems that would guide me to drive my organisation to be the right organisation doing the right thing in the right time-space for youth homelessness.
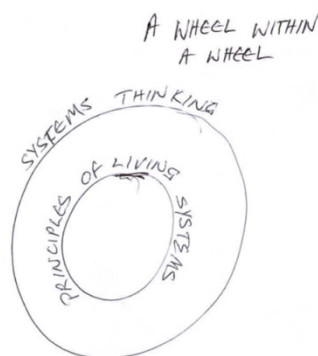
Figure 12: A wheel within a wheel

It is this that Wheatley (Wheatley, 2006) speaks of when she says: "What if we could reframe the search? What if we stopped looking for control and began, in earnest, the search for order? Order we will find in places we never thought to look before – all around us in nature's living, dynamic system." In that way we can: "Join with everyone [we] know in an organisation that opens willingly to its environment, participating gracefully in the unfolding dance of order." (Wheatley, 2006)

Section 4: Four principles of living systems

a. Principle 1: Self-organisation

This existence of repeating patterns leads us to the principle of living systems of the spontaneous emergence of order – or 'self-organisation'.

This is the principle that living systems exhibit a pattern that is not directed by an external force. It emanates from the system and can be considered as emergent – that is, it is a pattern that emerges from the whole, not from a component part. It is this 'spontaneous emergence of order that became known as self-organisation' (Capra & Luisi, 2014).

If you think about nature, a tree, a leaf, or a snowflake, you may note an inherent pattern in each. The snowflake is famous for each one being unique, but each one has a discernible pattern. It is this existence of patterns that has sent many scientists such as David Bohm and Albert Einstein on the path of looking for evidence that there is a natural order underlying the universe.

According to Capra, Einstein 'strongly believed in nature's inherent harmony, and throughout his scientific life his deepest concern was to find a unified foundation of physics' (Capra & Luisi, 2014). Likewise, Bohm posits the existence of an 'implicate order' from

which all things manifest as physical entities as part of the 'explicit order'. (Bohm, Wholeness and The Implicate Order, 2002)

b. Principle 2: Information-rich and intelligence-seeking

A second principle of living systems is that they use information to make intelligent decisions. This is done using the mechanism of feedback loops, or communication between different parts of the system.

If we think about the system that is nature and how within that system different parts are in constant communication so that that they know what to do next. This is particularly important when we consider how an ecosystem might change and that the different parts of that ecosystem need to know what is happening so that they can also adapt and hopefully thrive.

For example, an ecosystem might start getting hotter and the parts of the ecosystem need to know this to adapt their own behaviour so that they can thrive in a warmer environment. If you are a part of the system that does not get the memo that the temperature is going to increase, then you are outside of the feedback loop and have limited opportunities to change your behaviour.

c. Principle 3: All elements are interrelated

Another key principle of a living system is that all things exist only in relationship to each other. Everything is interrelated and interconnected. What happens in any part of a system can have an impact on any other part and on the whole. I should note this is a principle of all systems, living and non-living.

This idea that everything is connected is neither new nor controversial. "Develop your senses – especially learn how to see. Realize that everything connects to everything else," said Leonardi Da Vinci (1452-1519).

System thinking pushes this into a more controversial field with an ongoing conversation about the potential 'oneness' of the universe. This argues is that 'everything' in the universe is actually 'one thing'. This is an ongoing debate and where philosophy and quantum physics meet.

If you believe in this then David Bohm (Bohm, On Dialogue, 1996) is the quantum physicist for you, and his work informs a lot of the authors such as Capra, Wheatley, Peter Senge, and Otto Scharmer in this field. Bohm believed in an 'implicate order' or that the hidden view of reality is a form of energy waves and that manifest in an 'explicit order' which is that which we can see and experience. This fits with the discovery in quantum physics that things can exist as both waves (i.e., a wave of energy) and also a particle (i.e., you and me, existing right now as humans).

Says Capra: "This is how the new physics reveals the oneness of the universe. It shows that we cannot decompose the world into existing smallest units. As we penetrate into matter, we do not perceive any isolated building blocks, but rather a complex web of relations between the various parts of the unified whole" (Capra & Luisi, 2014).

d. Principle 4: Beauty, coherence, and harmony

I think that one principle or value of a living system is beauty, coherence, and harmony. This is most obvious in nature, when you see an awe-inspiring system replete with beauty and meaning.

Years ago, I swam around what I thought was a small island – Heron Island. I found out that it was not an island per se, it was a coral cay – a part of the coral that makes up the

Great Barrier Reef that had stuck up above the sea. Over hundreds of years the migratory

Noddy Tern would pass over and its guano formed a fertile crust on the cay. The bird then

brought the seeds of the tree it relies on – the Pisonia tree. The seeds are sticky and get caught

in the birds' wings and the seeds would fall as it flew over the cay. The seeds took root and a

Pisonia forest grew on Heron Island which the Noddy Tern now uses as a stop in its

migratory travels. The whole island has been created by birds for birds, it is one big, glorious

system – replete with beauty, coherence, and harmony. When you are there, standing on this

tiny coral cay, you glimpse an understanding that the Noddy Tern is not in your world, rather

you are in its nest.

William Isaacs (Isaacs, 1999) refers to this when he refers to the Good, the Beautiful

and the True. These domains were held by ancient Greeks to form "the horizon for

integrating the interior and the exterior dimensions of human life". Isaacs says that: "Any

leader today might ask this question: In what way am I helping to bring the good, the true and

the beautiful into the policies and actions for which I am responsible?"

In the corporate world these values are rarely referred to, but as a living system they

are there, swimming below the surface.

Section 5: A model for application of living systems principles within organisations.

Let us recap for a moment to see where we are and hopefully where we are going.

- We are using systems thinking as a lens with which to make changes.

- We are trying to change the organisation that I work in – the Property Industry
  Foundation.

- We want to increase its impact on youth homelessness.

- We are using principles of living systems on and in the organisation to effect change.

One note here is to make clear why I am using principles of living systems to make change. I do that because (a) I see the organisation as a living system and as such, I am expecting these principles to be there, even if they are hidden, and (b) if these are principles then I should be able to work with them, ride a natural wave if you like, to effect change.

As Wheatley says: "This is a world that knows how to organise itself without command, control or charisma" (Wheatley, 2006).

For a moment here I want to consider how we construct knowledge. All knowledge is a model, or a way of seeing. Things exist around us, and then models help us decide how we are going to see or interpret what the things around us mean. For me this is the key to critical thinking – the ability to understand that we use models to make meaning and that we have the power to create new models, or new paradigms.

Here I share the first model I made in the MA for Critical and Creative Thinking.

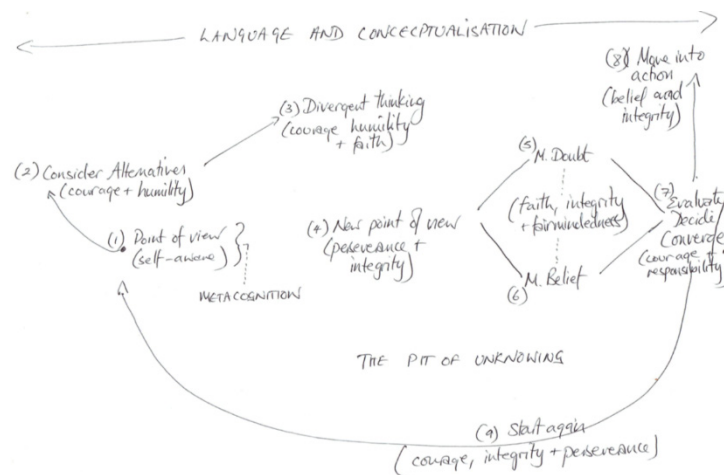Figure 13: A model for critical thinking

It was during the Critical Thinking course led by Peter Taylor. We spent the first part of the course discussing and thinking about what we thought critical thinking was. We did not read any literature to access what I refer to as 'new knowledge', instead we had to surface what we already knew or 'known knowledge'. I ended up through this process quite at sea. I

got lost and in reflection I was not used to relying on my own knowledge to make sense of new concepts. I expected to be taught by someone, I did not expect to have to teach myself. From that experience I constructed the model – metaphorically I refer to this as building a raft to get me back to shore when I found myself at sea. It is not a pretty model, but it is the first one I had done, and I felt immensely proud at the time. I felt as though I had surfaced organic known knowledge from within to create a base, and then I had connected it to new knowledge that I had discovered. This made the model both unique to me and deeply authentic.

I am using the same model-making skills here. I am synthesising the models of far more sophisticated model-makers than me – in particular, Michael Goodman's Iceberg Model (Goodman, The Iceberg Model, 2002), Donella Meadows 12 leverage points, and Peter Senge's call for small interventions – to make a raft to get me to shore from the sea of living systems theory.

I have surfaced my known knowledge in that I have always believed that everything is connected and have used the models of system thinking to show how this might work. Furthermore, my known knowledge includes the belief that humans are part of the larger living system of nature at work and hence that groups of humans can learn from the principles of living systems. I want to connect this known knowledge to put to work in my organisation and for this I have to construct a raft from my known and new knowledge.

1. **Michael Goodman's Iceberg Model**

The Iceberg Model by Michael Goodman is a diagnostic tool for systems thinking. It asks you to look underneath what is happening to s ee the whole picture. Like the iceberg, in systems thinking most of what is happening we cannot see. Goodman's model has 4 levels – what is happening on the surface, then what are the patterns of behaviour, what are the

structures, and what are the mental models. An illustration is below.

EVENTS – What's happened?

PATTERNS OF BEHAVIOUR
What's been happening? / trends / changes

STRUCTURES
What is influencing the patterns / relationships between the parts

MENTAL MODELS
Values, beliefs + assumptions
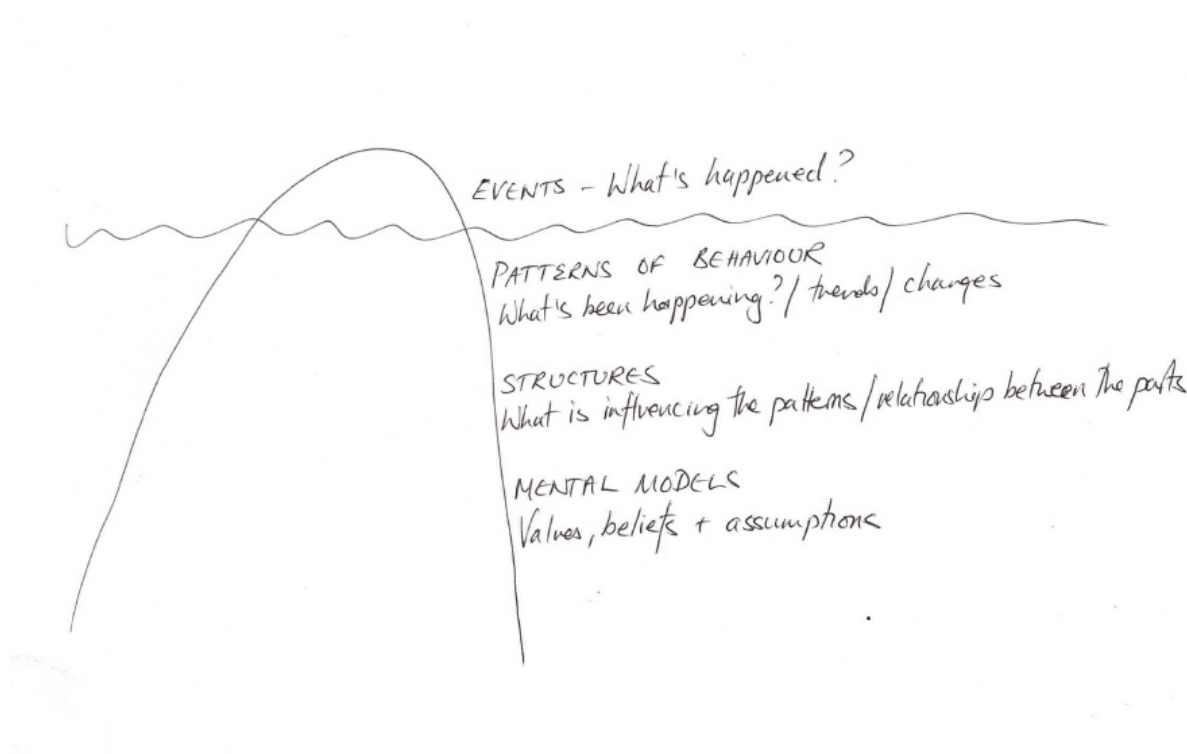
Figure 14: Michael Goodman's Iceberg Model

2. Donella Meadows' Leverage Points

There is not room to do justice and give a full explanation of Donella Meadows brilliant analysis of where to intervene in a system with the 12 leverage or intervention points, she developed. Instead, here I will list and categorise them on the following page and later show how they can be used in my model. I will note that her 12 points bubbled up spontaneously in a meeting she was in about global trade regimes (Meadows, 2008). It was in "a moment of frustration that I proposed a list of places to intervene in the system," she recalls. It is an illustration of the creative process – she had spent years working in the field and on that day the list simply emerged. "What bubbled up in me that day was distilled from decades of rigorous analysis," she says.

Meadows' Leverage Points

Order of importance	Leverage point	Category
12	Numbers – constants and parameters such as subsidies, taxes, standards	Physical: Here we will intervene by changing parameters like interest rates or change physical structures by mandate fewer cars on the road or re-routing traffic, so we have less pollution in a particular area.
11	Buffers – the sizes of stabilising stocks relative to their flows	
10	Stock and flow structures – physical systems and their nodes of intersection	
9	Delays – the lengths of time relative to the rates of system changes	Informational: Here we will make sure that information flows quickly and well around the system so it can respond quickly. Or we might make sure that more people have access to good information so they can make better decisions.
8	Balancing feedback loops – the strengths of feedbacks relative to the impacts they are trying to correct	
7	Reinforcing feedback loops – the strength of the gain of driving loops	
6	Information flows – the structure of who does or does not have access to information	
5	Rules – incentives, punishments, constraints	Social: Here we will decide the rules of the system by re-writing the constitution, this could include giving the system the right to make its own changes which we often refer to as evolution.
4	Self-organisation – the power to add, change or evolve system structure	
3	Goals – the purpose of function of the system	
2	Paradigms – the mindset out of which the system arises	Conscious: Here we are at the highest place of leverage and are looking to change the idea behind the system, or even realise there is no one idea that we need to use. We could shift between different ideas according to what we need.
1	Transcending paradigms	

Figure 15: Donella Meadow's Leverage Points

What is important for my model is the categorisation. Do you intervene in the system at the physical level, at the informational level, at the social level or at the conscious level? This will become more apparent when we work through the model.

3. Peter Senge's 'small actions'

Finally, Peter Senge's 'small actions' give another potential path (Senge, 1990). According to Senge: "Perhaps the most significant insight with regards to the principle of 'leverage' in systems thinking, is that it shows how small, well-focused actions can sometimes produce significant, enduring improvements, if these actions occur in the right place within the system." I think of it like this: To grow an oak tree you do not make the oak tree; you just plant a seed.
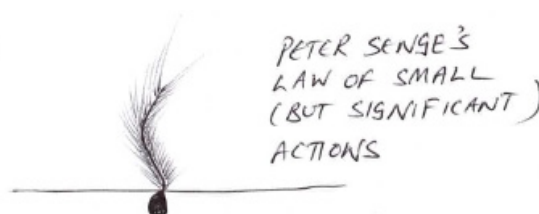
Figure 16: Peter Senge's law of small actions

4. The complete model

We can see a visual representation of the model here where I move through the 3 steps – using the iceberg to understand what is going on, the intervention points to think about where and how I want to intervene, and then a small action so that I do something.

Figure 17: Three-step model

What we can also note is that this is also a model of research in action where evaluation and diagnosis are the first part of the cycle. I then move into propose and planning mode with a decision about which intervention point to use. I then move into the implementation part of the process with a small action. I could then at that point reflect and repeat, moving out into another cycle of action research.
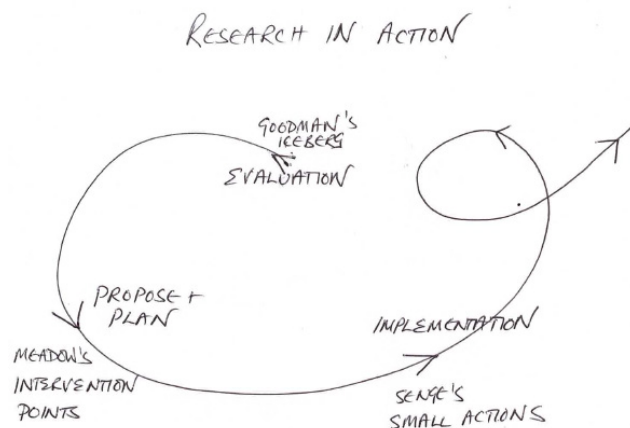
Figure 18: Research in action

Section 6: Research in Action

Having constructed the model, I am now ready to put my research into action. I will look at each living principle that I want to foster in my organisation and see how the model can help me to move forward. I will focus most of my time on the first principle of self-organisation to show how the model works, with a shorter overview of the following three principles.

Principle 1: Self-organisation

How can we foster self-organisation in organisations?

First, I must establish that in the context of the Foundation I am not seeking 'true' self-organisation, where I might bring together a group of people with no goals and objectives to see what spontaneously emerges. We have goals and rules at the Foundation – we want to build 25 bedrooms a year, we work from an office, we run campaigns and have a defined mission and vision. What I want to explore is that within that defined structure, how can we best self-organise to achieve our goals?

At the Foundation, I run what I consider to be (and hope is) a relatively flat organisation. There are ten of us and all nine report directly to me and are considered equal in that there is a limited hierarchy – I cannot erase that I am the CEO and have particular responsibilities. This structure was established by me when I arrived there.

I aim to operate what I term a 'distributed leadership' model. This means that anyone person can be the leader at any one time, depending on skills and context. While everyone is equal in the organisation there is still expertise and depth of experience and that must be both respected and valued.

For example, the head of fundraising is the fundraising expert. What she says around fundraising should be adhered to and we should follow her lead (including myself) on fundraising initiatives. Similarly, the chief financial officer is an expert on finances and governance, and we should follow his lead and respect his advice in this field.

Other members of the team get in behind them and support the initiative with their relative skills. For example, the head of fundraising commences a fundraising initiative, and the CFO supports her with his budgeting skills.

In this way I see the group as a holocracy, where we are all equal and anyone can take the lead on a project or initiative at any time where they have the skills and the ability to do so.

Holocracy is a form of management that relies on self-organisation and has been practiced by a range of companies including Zappos and Morning Star (Bernstein, Bunch, Canner , & Lee, 2016).

This approach has been appreciated by the team but there are a couple of observations I would make.

- It has been possible to do this only by getting the team to work towards high levels of trust and openness and that is an ongoing journey. Dialogue has been key in building this trust. For example, we use a 'dialogue framework' every day in our 30-minute morning meeting where we share:

    o What I am grateful for today.

    o What I am focused on today.

    o What strengths will I use to achieve what I need to do today. (We use a strengths framework that I work with a consultant on).

    o What I need help with today.

The use of these questions and this approach has led to a level of openness and understanding, and I reflect on how to deepen that.

- Each member of the team has to be committed to developing so that their skills are at a level that feeds back into the level of trust in the team. There are different levels of this kind of commitment across the organisation.

- My role as leader and how that fits in with a self-organising organisation. In an ideal world I would like to cede my role as leader where it is appropriate. There are some things I cannot cede – the CEO has some specific responsibilities particularly around governance that cannot be shared. I sign the annual accounts, for example. But there is still a leap of faith for me as the leader to step back to increase the ability for the

organisation to self-organise. My role should be to set direction, culture and investment that is channelled towards a shared, meaningful pursuit in an ideal self-organising organisation.

Let us run this through the model.

The aim: Foster increased self-organisation at the Foundation.

1. **Evaluate using Goodman's Iceberg Model looking at a particular event.**

   Event: We are currently running a fundraising campaign where I have deliberately not led the project but have enabled others to run the campaign with some input from me.

   Patterns: We have brought in new people who are all very good in their field so less input from me has been required on fundraising campaigns. We have also got better at planning.

   Structures: We run a flat non-hierarchical model which allows for everyone to have input directly.

   Mental models: We believe in collaboration, equality, and dialogue.

2. **Decide where to intervene in the system using Meadow's leverage points.**

   The focus here will be on which of the 4 categories – physical, informational, social, or conscious that I am going to work in. If it was physical, for example, I might look to hire another person to add to the team. Or if it was informational, I might make sure the team had better information about how the fundraising campaign was performing in real time. If it was social, I might change the rules and insist that the fundraising team meet every day, for example. However, in this case I decide I want to work at the conscious level – I want to foster a deeper model of collaboration and dialogue within the team. This is a paradigm shift,

because no matter how much we talk about collaboration, the dominant paradigm for how we work, and think is deeply individualistic. Think back to Rene Descartes and how mechanistic thinking sees all the components as separate from each other. That underlies our view that we are firstly separate and independent components, that come to work together as a second action. I would refer here back to the work of David Bohm (Bohm, Wholeness and The Implicate Order, 2002), which underlies a lot of systems thinking. Bohm posits that we are firstly 'one thing' that exists as in an 'implicate order' almost as a field of energy. Then, says Bohm, we manifest as 'separate things' in an 'explicate order'.

So far, so good. I can see what I want to do, and Meadows' work has directed me to look at the conscious level of intervention, but how do I make that into action? Trying to change the conscious approach behind an event feels overwhelming and I do not know where to start.

3. Use Senge's small actions

Now I take a breath and contemplate Senge's advice around small but significant actions being capable of creating lasting change. Two things bubble up. First, I recall Meadows' exhortation to think about counter-intuitive and non-obvious actions. "Leverage points frequently are not intuitive. Or, if they are, we too often use them backwards, systemically worsening whatever problems we are trying to solve," she says. Then a second thought comes to the surface – the quote attributed to American anthropologist Margaret Mead where she says: "Never doubt that a small group of committed citizens can change the world; indeed, it is the only thing that ever has". Right there is the moment of creative thinking when solutions and ideas bubble up. It is a result of deep immersion in the work, combined with reflective practice that lies at the heart of creative responses.

I decide to order the quote to be put up on a prominent wall in our office that every employee, donor, and partner will see as they enter the office. It is to remind them – to shift their frame of reference – when they enter into our field. It is to embed that we work first from a place of collaboration and togetherness. I am playing with paradigm change through the use of language. How do you change paradigms? "You keep speaking and acting, loudly and with assurance, from the new one," says Meadows. "You insert people with the new paradigm in places of public visibility and power." Putting the quote up on the wall is as loud as I can make it and being the CEO, I have the power to do it.

Principle 2: Information-rich and intelligence-seeking

For systems to function well they require information or feedback from their environment. A baby's brain only grows if it gets connection and feedback from another human. Without feedback from our environment, we effectively do not function. When I first arrived at the Foundation there was a lack of transparency throughout the organisation where the left hand rarely knew what the right hand was doing. We have done a lot of work to increase transparency and change the culture. I would make one point here which is that information can be a double-sided experience. We believe that more information is better, but in an information-rich world, we must also consider the quality of the information that we receive.

Let us run this through the model.

The aim: Increase access to information to become more intelligent.

1. **Evaluate using Goodman's Iceberg Model looking at a particular event.**

Event: The CFO now gives all staff a presentation every month on the Foundation's finances, so everyone knows how we are performing.

Patterns: I have encouraged the CFO to be more part of the business by moving his office to be closer to the team. I have also encouraged him to see himself as a leader in the business and have taken him on a one-day leadership course with me. We have moved to a short daily meeting which has increased the level of transparency across the business.

Structures: There is an increased understanding that transparency contributes to the performance of the business.

Mental models: We believe in increasing access to information because it allows us to respond correctly to the environment.

2. **Decide where to intervene using Meadows' leverage points**

It seems instinctive here to intervene at an informational level where we might look at how to increase the level of information going through and around the organisation. I will particularly focus on reinforcing positive feedback loops.

3. **Use Senge's small actions**

I have asked the sales team who have frontline contact with our supporters to regularly report back on those interactions. In particular when we get new donors and spread that information around the larger system it creates a positive effect and increases confidence.

Principle 3: All elements are interrelated

If we can observe the principle of interrelationships, then how do you apply it to an organisation as a living system? Once we understand that everything is interrelated and interconnected, that it is at one time both whole and made of parts, what action do we take?

In business, there is a common saying that business is all about relationships. But the principle of everything being interrelated is beyond having relationships. Interrelationships imply a connected ecosystem, rather than a series of transactions. How do I transfer this into the organisation?

Let us run this through the model.

Aim: To foster an understanding of interrelationships and ecosystems.

1. **Evaluate using Goodman's Iceberg Model looking at a particular event.**

   Event: We are hosting a Friends of the Foundation event in Sydney for the first time. This will have our committee members inviting people to the event and publicly advocating for us.

   Patterns: I have been championing the concept of advocacy at the Foundation with board and committee members.

   Structures: The relationship between the Foundation and its supporters is changing. It is not a series of linear relationships where our supporters give us money and we build homes for homeless youth. It is a reciprocal two-way relationship where we also give back to our supporters by creating community and cause.

   Mental models: We are all interconnected and interrelated and relationships are two-way.

2. **Decide where to intervene using Meadows' leverage points**

   I am again drawn to working at the conscious level by changing the paradigm through changing language. I already have some form with this at the organisation. When I arrived, we were referred to colloquially through the acronym PIF instead of in full as the Property

Industry Foundation. The colloquial nomenclature was deeply embedded in the culture of the organisation but made it, from my point of view, difficult to understand or penetrate. I have since worked with the board and we now refer to the Property Industry Foundation in full in all documentation etc. This sounds as though it was simple to do, but it ran up against significant cultural resistance.

3. Use Senge's small actions

I am going to start embedding the language of ecosystems into the Foundation. Positioning us as being part of the ecosystem implies a changed relationship between us and our supporters. We are now all in an interconnected web, rather than in a linear relationship of donor and recipient.

Principle 4: Beauty, harmony, and coherence

Systems in nature are so beautiful. I think about how a group of humans is analogous in living systems theory to a group of trees, a forest. But I suspect we rarely look at a group of humans and think of them as being as beautiful, harmonious, and coherent as a forest can be.

Sometimes, there is a transcendence in humans being together – particularly in art when a group can create something that lifts us to a different place. How do we foster that kind of activity at work? How can I make my work resemble the seagrass, moving in harmony with the larger forces around us?

Let us run this through the model.

Aim: To foster a sense of harmony, coherence, and beauty at the Foundation.

1. **Evaluate using Goodman's Iceberg Model looking at a particular event.**

   Event: I have brought plants into the front part of the office and I water them regularly.

   Patterns: The plants have made the office better, but only I bring in plants and only I water them.

   Structures: I care about the environment we work in, but I wonder if my team sees the benefit and feel that they can be part of this process?

   Mental model: People do not believe that work should be beautiful. We believe in a divide between work life and home life – we do not see that they are one and the same.

2. **Decide where to intervene using Meadows' leverage points**

   Intervening on the physical plane seems the most obvious. We could bring more plants into the back of the office so everyone has one on their desk and I could agree that the Foundation funds this with a plant allowance! I would note that again I am drawn to the conscious intervention to explore why we do not think that work should be beautiful, and this could be something we explore in dialogue with the team.

3. **Use Senge's small actions**.

   Despite the obvious nature of the intervention (remember interventions should be counter-intuitive and non-obvious), there is nothing wrong with a linear response. I am going to ensure that everyone has a plant on their desk and see if that fosters a bit more responsibility for watering the plants!

Conclusion

Systems thinking and living systems are huge areas for exploration. I could not hope to adequately explore them here, so I took a slice through them, with a particular focus on my own organisation as a way to explore them.

There were two things I wanted to achieve with this paper, and both are encapsulated in the opening quotes. Meadows exhorts us to share our mental models to bring them to life. Often, we do not share what we are thinking. One reason is that we are loath to reveal ourselves, the other might be that we often lack a language to explain what we are thinking. While all we say can exist in thought, the same is not true the other way round. There are many things we think or experience that we do not know how to put into words. This field of study is esoteric and is a space that thrives on interdisciplinary knowledge and input, and potentially needs new language.

A case in point is from the introduction of Autopoiesis and Cognition by Humberto Maturana where he recounts his struggles to say what a living system was (Manturana & Varela, 1980).

"Obviously I had some inkling of what was the correct answer, because I rejected the unsatisfactory ones. After several years of these various attempts, I realised that the difficulty was both epistemological and linguistic, and that both my wife and my old professor, J.Z. Young, were right: one can only say with a given language what the language permits. I had to stop looking at living systems as open systems defined in an environment, and I needed a language that would permit me to describe an autonomous system in a manner that retained autonomy as a feature of the system or entity specified by the description."

Eventually with his colleague Varela they land on the expression 'circular organisation', but neither were happy with the phrase. One day, talking with a colleague about Don Quixote de la Mancha about his dilemma between following a path of arms (praxis or action) or the path of letters (poiesis - creation or production), Maturana writes: "I

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understood for the first time the power of the word 'poiesis' and invented the word that we needed: autopoiesis. This was a word without history'.

O' to have that power. To be able to invent language and through that create new meaning, or give meaning to existing, known knowledge that we do not yet have words for. I suspect that the tool for changing paradigms is language and it is an area where I would like to do future study.

With my limited language, I have sought to put into words what I instinctively feel about the world. That we are all connected. That we are part of a large and beautiful system. And if we can understand that and divine a path by creating models for action, the possibilities are endless – particularly for the hard work we must do in groups to meet the challenges of now and the future.

Then, I have looked for honour in implementation. How many times have I sat in strategy sessions with consultants and their expensive advice, and then taken that advice into the world to find it doesn't quite work as intended? Because, in organisational design and strategy, humans so often are not taken into consideration. This always strikes me as ironic, as organisations are nothing but humans in collaborative dialogue and action. There is only us.

I imagine a brave, new world where human-centred design results in brilliant, inspirational groups of people working together for a greater good. I hope this small piece of work helps me to develop my mental models and become braver about sharing them and putting them into practice.

At this point in my journey, I reflect on Senge's concept of personal mastery (Senge, 1990). Personal mastery, he says: "Goes beyond competence and skills, though it is grounded in competence and skills. It goes beyond spiritual unfolding or opening, although it requires

spiritual growth. It means approaching one's life as a creative work, living life from a creative as opposed to a reactive viewpoint."

There is a lot in this paper, but the point that I have arrived at is that the journey with Critical and Creative Thinking has answered the question I had in my head when I started. I am a very creative person, but I cannot draw, or dance, or sing. I have no artistic outlet for that creative spirit so I used to wonder, where could I put it? I do not think I am alone in thinking this, I think many people do not know how to channel their creative spirit. Now I have my answer – I can put it into my life and my work and that there is a practice I can follow that will enable me to grow the personal mastery of my creative spirit. I can create models for growth and practice that are authentic and meaningful. We all can.

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