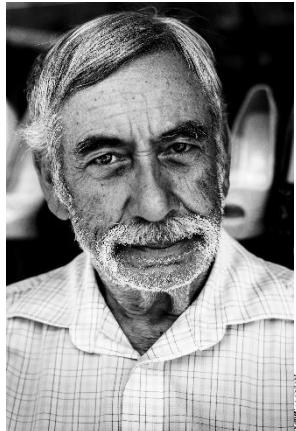


# Systems Curriculum virtual event series

Principles and practical applications of systems thinking in the investment industry

Session 2. Systems Leadership | 11 September 2024 | Pre-reading slides



## 0. Preface – Roger Urwin

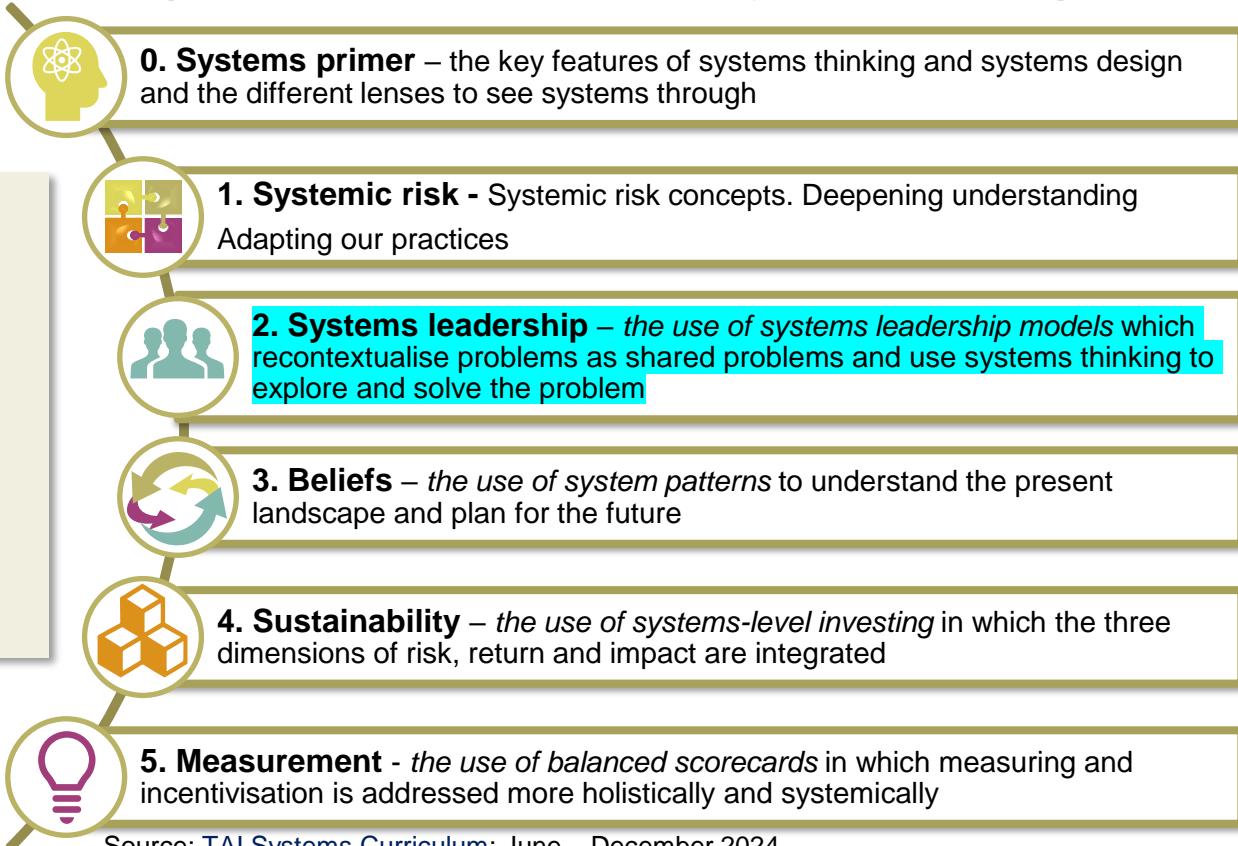
Defining systemic risk and its application

# Systems curriculum: understanding the power and practice of systems thinking



## 2. Systems leadership – 11 September 2024

- Pre-reading
- 90 minutes hybrid (45-22½-22½)
- Includes expert inputs
- Includes Q&A



Source: [TAI Systems Curriculum](#): June – December 2024

# Systems leadership

Define your terms

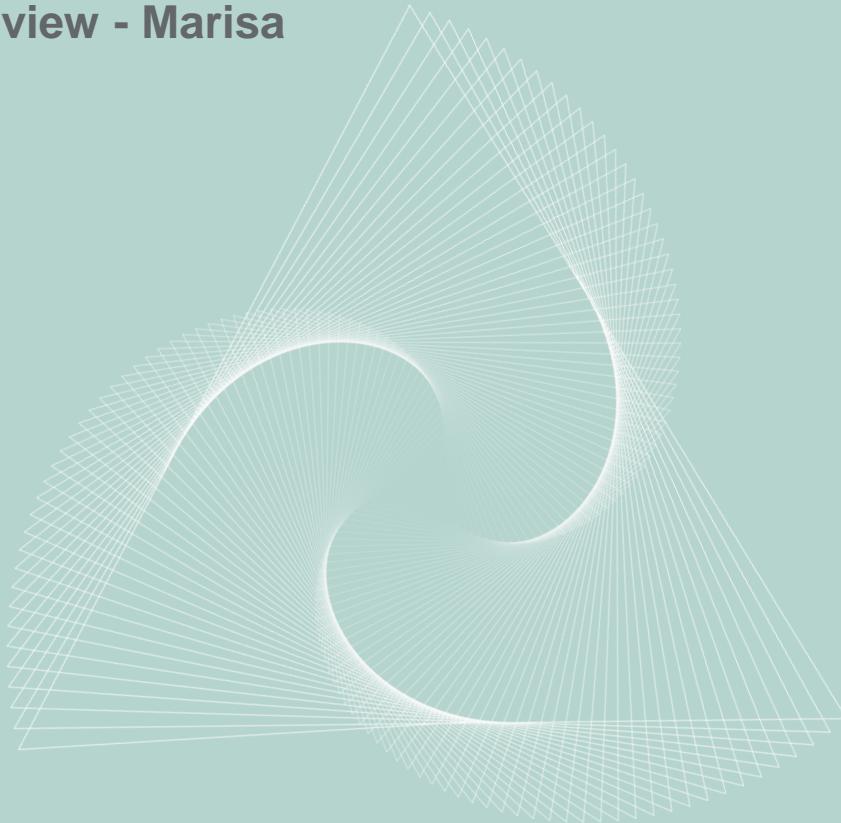
**“Systems leadership is a style and a method of leadership that draws on systems thinking to deliver longer term solutions to difficult challenges through co-creation.”**

-Thinking Ahead Institute

**“Systems leadership is a set of skills and capacities that any individual or organization can use to catalyze, enable and support the process of systems-level change. It combines collaborative leadership, coalition-building and systems insight to mobilize innovation and action across a large, decentralized network.”**

- World Economic Forum

# 1. Leadership Overview - Marisa



# Peer Study - the soft stuff 'superpowers' – forces of influence on actions and outcomes

Summit views reinforced the soft stuff is the hard stuff and the important stuff

<b>Superpowers</b>	<ul style="list-style-type: none"><li>Organisations are living systems driven by seven 'superpowers' that influence actions and support outcomes</li></ul>		<p><b>Connecting superpowers unlocks combinatorial power.... but challenges organisational skills</b></p>
<b>Combining forces</b>	<ul style="list-style-type: none"><li>These disparate forces have greater influence when combined and aligned</li><li>Important to apply systems thinking and systems leadership to these forces</li></ul>		<p><b>Joined-up</b></p> <ul style="list-style-type: none"><li>Joined-up = getting the fullest benefits from collaborations and combinations across people, teams, organisations and ideas</li></ul> <p><b>Opportunities</b></p> <ul style="list-style-type: none"><li>All areas provide big opportunities for organisational alpha.....but all are challenging to execute because of organisational frictions</li><li>Organisations tend towards one dominant in-group and multiple out-groups – siloes; and often miss the full benefits of collaborating</li></ul>
<p><b>Measuring and attributing outputs and outcomes from collaborative actions is particularly difficult</b></p>			

# The power of positive leadership and culture

Thinking Ahead multiple engagements with asset owners and asset managers

- Leadership is ...
  - guiding and impacting outcomes, inspiring and motivating people, part of culture
  - enabling groups of people to work together to accomplish what they couldn't do working individually
  - defined through something you do collectively, not something you are
  - broadly defined as the acts of anyone who steps out of their regular tasks to help and motivate others
  - maybe is one third from born, one third from study, one third from practice
- The most significant cultural dimension of leadership is flatness/hierarchy and is captured by the degree of distributed power – how culture empowers. Leadership roles and cultural influence can be played by many people in the organisation
- Management and leadership intersect but are different. Leaders have wisdom and get their people to follow their example; while managers have competency and have their people follow their instruction. Leaders are shapers of culture, managers are carriers of culture
- Leadership attributes that are increasingly sought as edges and can act as complements to dominant leadership include systems leadership, servant leadership and transformational leadership
- These leadership principles can help to shape effective leadership and culture:
  - Speak out | people crave strong leadership shaped from rich values
  - Draw on your legitimacy | speak within the sphere of your competency and stakeholder reach
  - Be empathetic | read the audience
  - Leadership courage necessary | cautious leadership deals badly with the need for change
  - Be clear and consistent on your values | organisational values and your values should sync, be authentic to these values

# What about systems leadership

- Systems thinking enables different versions of leadership to be used – four distinct categories of leadership opposite. Each has its place in effective leadership. Agility to mix styles according to context is important
- **Systems leadership** is a set of skills and capacities for an individual or organization to support the process of systems-level change. It combines collaborative leadership, coalition-building and systems insight
- In our context, this concept chimes by applying systems thinking to the organisation as a complex living organism with its teams as its fundamental building blocks
- System leaders catalyse their team colleagues to think more deeply about what is really happening, explore options beyond popular thinking, and search for higher leverage changes through progressive cycles of action and reflection and learning

*'Knowing that there are no easy answers to truly complex problems, system leaders cultivate the conditions wherein collective wisdom emerges over time through a ripening process involving tools and 'scaffolding' that gradually brings about new ways of thinking, working and acting'.*

(Source: Senge)



# B-shaped leadership - the transformational opportunity

<b>Leadership has got tougher</b>	<ul style="list-style-type: none"><li>Leadership has new expectations to carry, new narrative to deliver and new judgements to make at a time when uncertainties have reached a new level. We should recognise how often decisions will not be clear-cut</li><li>Decisions have got more difficult with more complex situations, more uncertainty present and limited relevant data.</li><li>There is increasing appetite and need for B-shaped leadership over A-shaped leadership in the context of increasing empowerment, joined-upness and humanism</li></ul>
<b>Leadership</b> <b>Structure...</b> <b>Vision...</b> <b>Style...</b> <b>Strategy...</b> <b>Norms...</b>	<p><b>A-shaped – pyramidal lines:</b></p> <ul style="list-style-type: none"><li>linear and siloed</li><li>business plan, budgets, results</li><li>dominance, hard power</li><li>short-term, transactional, win-lose</li><li>rigid and all-seasons</li></ul> <p><b>B-shaped – looped lines:</b></p> <ul style="list-style-type: none"><li>flat and networked</li><li>positive stakeholder outcomes</li><li>serving, empathy, soft power</li><li>long-term, systems, coalitions</li><li>versatile and situational</li></ul>



# Leadership needs



## 1. Leadership role

Alignment of strategy, development of potential, motivation for execution



## 2. Communication and connection

Vision and values to the fore



## 4. Innovation

Judgement, creativity and courage are all critical



## 3. Humility

Empathy and listening to produce shared goal combinations



## 6. Leadership mindset

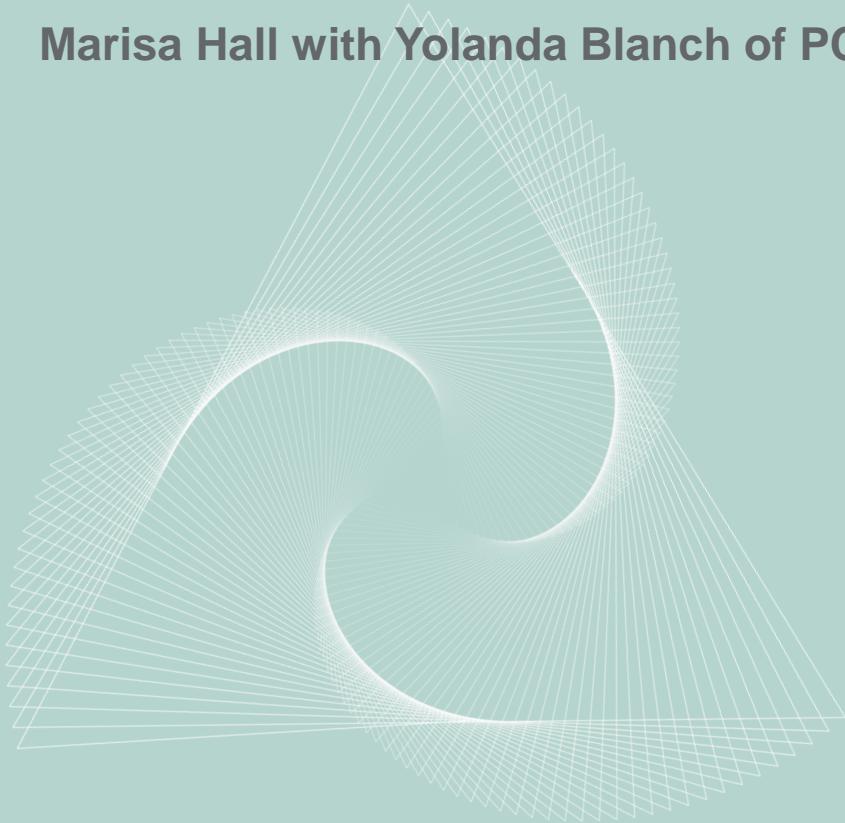
Commitment to emotional intelligence, forward thinking and system fluency



## 5. Coaching

To engage and co-create across generations and cultures

# Marisa Hall with Yolanda Blanch of PC30 video on Systems Leadership



Yolanda Blanch  
Chairperson  
Pensions Caixa 30 (PC30)

**Thinking Ahead Institute**  
An innovation network founded by WTW

# Leadership polling

How is the balance and inclusiveness in your leadership model?

**SUPERTEAMS**

Our leaders' style emphasises ...

Dominance and confidence with hard power authority  
Tribalist narrative ('them and us')



Serving and empathy with soft power influence  
Inclusive narrative ('in this together')

Our leadership strategy tends to...

Be short-term and transactional  
See things in terms of win-lose and bargaining



Be long-term and system-savvy  
See things in terms of solidarity and coalitions

Our teams are structured...

In hierarchical organisational design  
With divisions and siloes

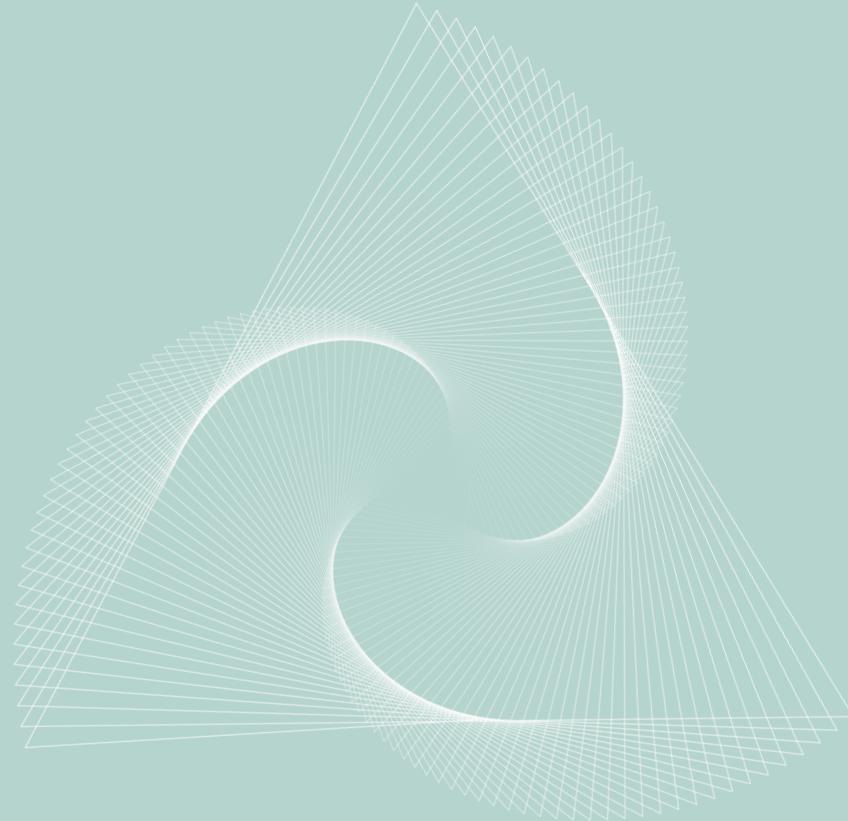


In flat networked organisational design  
With teams and networks

Have you a good balance of **dominant black and white** and **empathetic green** attributes?

# Systems Leadership

## Case Study – Tim Hodgson



# The inner dimensions of systems change

Psychological, social and spiritual dimensions are often over-looked in sustainable systems transformation

## Inner transformation for systemic change

- Personal values, beliefs, and behaviours significantly influence societal structures and actions

## Connection between inner and outer worlds

- Our internal world shapes our external reality

## Need for a holistic approach

- Addressing sustainability requires both external (systemic) and internal (personal) transformation

## Importance of collective action

- Individual transformation can catalyse broader societal change through shared values and goals

## Role of education and awareness

- Fostering understanding of the interconnectedness between individuals and the planet is essential

## Emphasis on overall well-being

- A holistic approach to sustainability includes individual and collective well-being

# Case study: Christiana Figueres

A catalyst for the global climate movement



**“For change to become transformational, our change in mindset must manifest in our actions.”**

-Christiana Figueres



## 2. Systems Leadership - Roger Urwin

(1) A style of leadership.

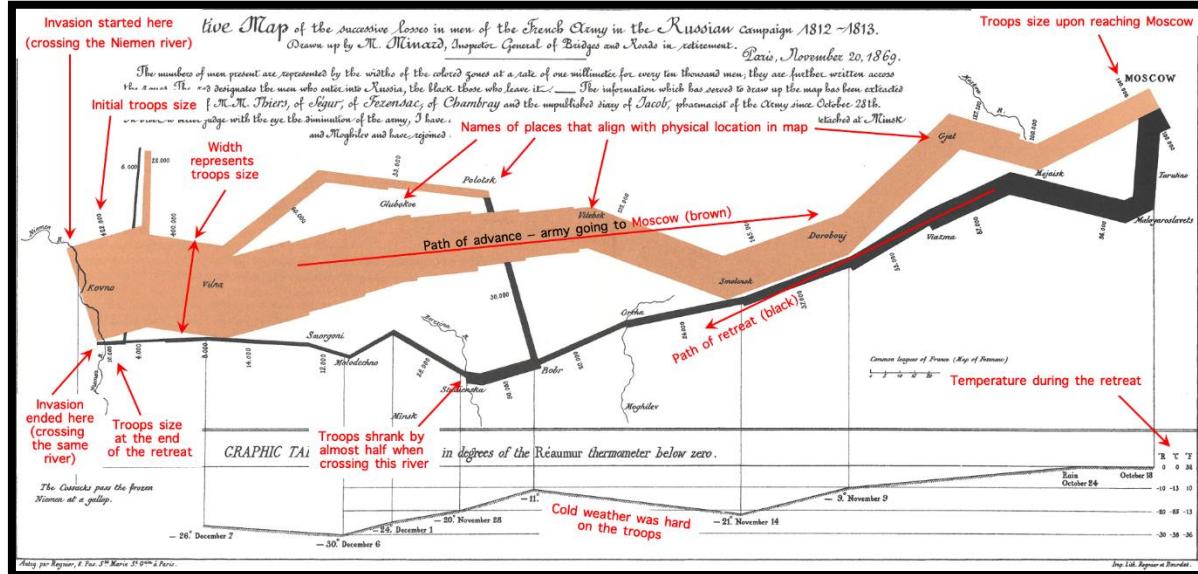
A method in leading change



# Defining Moments

## The 'greatest infographic ever'

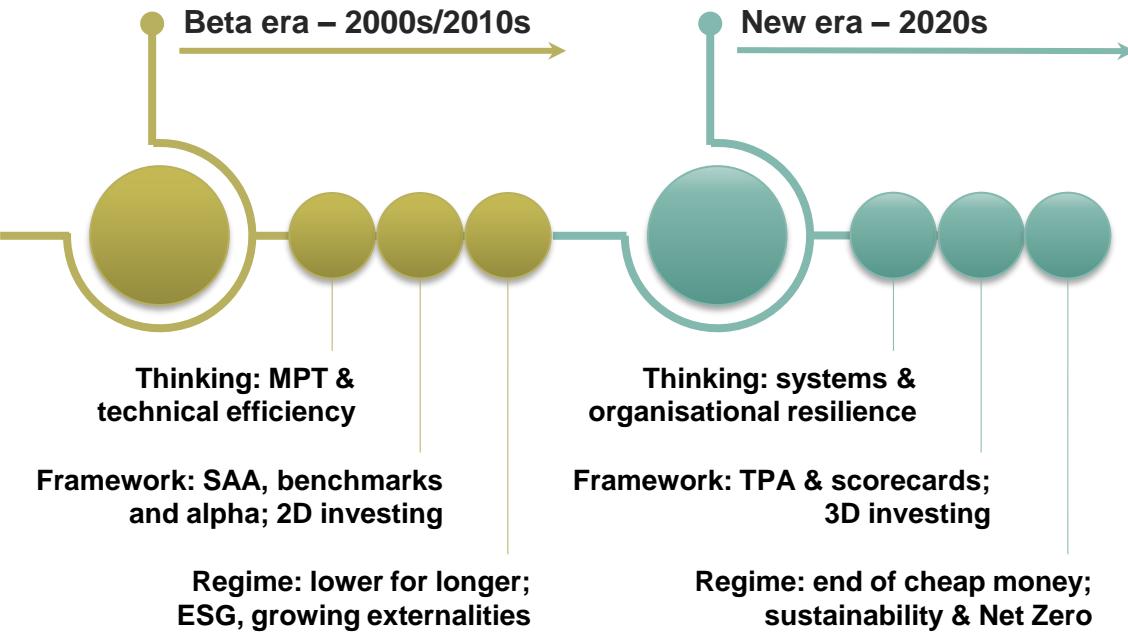
Minard's account of Napoleon's march on Russia in 1812-13



- The story  
... of leadership, inspired and flawed
- The data  
... 7 data streams
- The theory  
... explaining the human loss

# Investment industry era change – thinking, framework and regime

Change on multiple fronts Structural change is generally slow and sticky



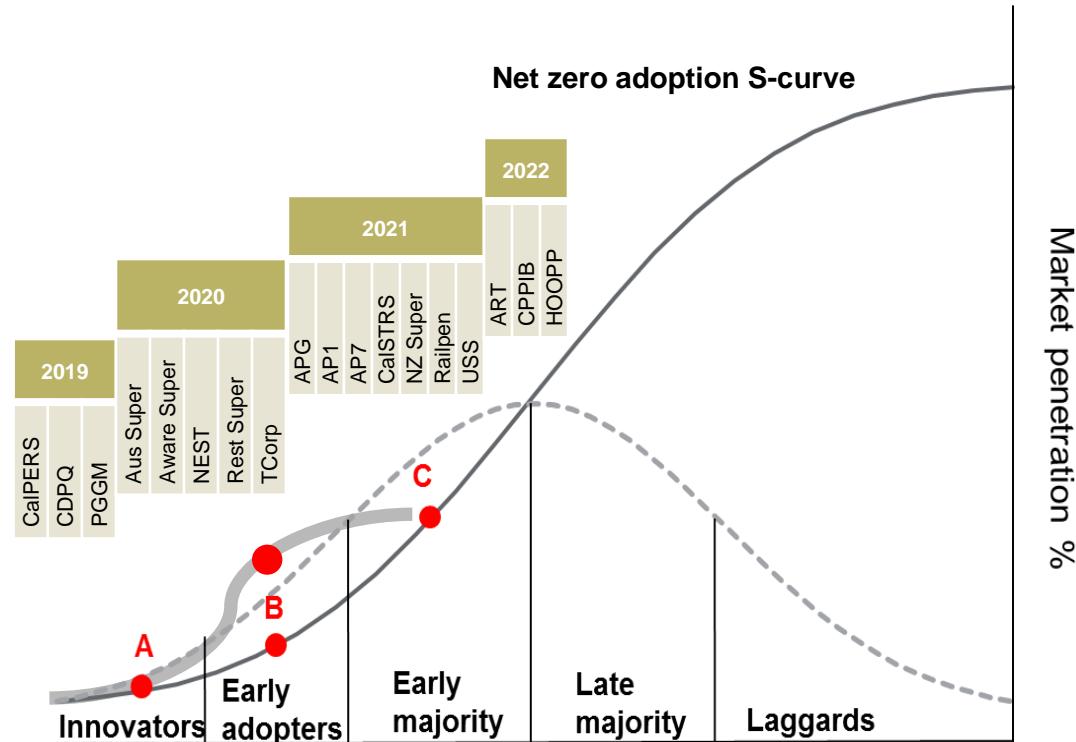
- Are we at a major inflection point in terms of how the world operates? **The world has several crises** to wrestle with. It has geopolitics, it has climate change and the issues of inequality that could collectively challenge capitalism as we know it.
- The principal asset owner model of **multiple external managers has come under pressure**. Internalisation has progressed, particularly in listed markets and further versions that internalise private market investing via offshore investment teams are now being tried. These carry many advantages, but their effectiveness can only be judged over long periods of time with individual contexts significant.
- All asset owners retain complex operating models using many third parties. They have always had **multiple stakeholders**, but the reality is that stakeholder management has got harder with more pressure being brought to bear by sponsors. In this situation, it is no surprise that governance arrangements are under pressure.
- The macro has fundamentally changed and quite swiftly from lower to longer to the end of cheap money. Investment beliefs need a big makeover with rates and inflation very different going forward. We again face lower real return expectations.

Big changes occurring in the big ecosystem settings

# The evolution of net zero investing

## The systems leadership needs from net zero

- The S-curve is used to describe the usual shape of innovation growth
- Investment industry innovation maturity splices the faster moving physical technologies (like fintech and AI) with the slower moving social technologies (like governance)
- AO net zero adoption (thick grey line) moved extremely quickly in the run-up to COP26 in 2021(A→ B) but has then slackened (B→C) with the challenge in finding the political capital and governance budget needed to implement it through systems leadership
- 18 peer funds out of 26 have made net zero commitments with movement peaking in 2021



## Systems leadership principles

See *The Dawn of Systems Leadership* | Peter Senge et all | 2015

<b>Systems leadership</b>	<p>In our industry context, I think it chimes at three levels:</p> <p>drawing on wider systems thinking in our investment industry and societal and environmental context;</p> <p>applying systems thinking to the organisation (WTW, asset owners, asset managers, etc) as a complex living organism ie the organisation is a system subject to change;</p> <p>applying it also in a team context to desirable practice reflecting fuller appreciation of many forces (hence superteam)</p>
<b>Peter Senge work</b>	<p>The Dawn of Systems Leadership attached article is good narrative explain some features of the subject. It is co-authored by Peter Senge whose business classic on learning organisations (<i>The Fifth Discipline</i>) drew heavily on systems thinking. Some of the narrative from this article is really resonant as follows, I have taken out some key passages here to illustrate the messaging</p>
<b>Systems leaders capabilities</b>	<p><i>There are three core capabilities that system leaders develop in order to foster collective leadership. The first is the ability to see the larger system. The second involves fostering reflection and more generative (=productive) conversations. The third centers on shifting the collective focus from reactive problem solving in the short-term to cocreating the future in the long-term.</i></p>
<b>Systems leaders focus</b>	<p><i>As these system leaders emerge, situations previously suffering from polarization and inertia become more open, and what were previously seen as intractable problems become perceived as opportunities for innovation. Short-term reactive problem solving becomes more balanced with long-term value creation. And organizational self-interest becomes re-contextualized, as people discover that their and their organization's success depends on creating well-being within the larger systems of which they are a part.</i></p> <p>In short, systems leadership is big enough to tackle the systemic problems and emotionally-savvy enough to wrestle with the people problems too. How is that different from most conventional change efforts? It comes down to being uniquely able to read people and influence people and not conceded to natural human impediments.</p>

## 2. Systems Leadership - Roger Urwin

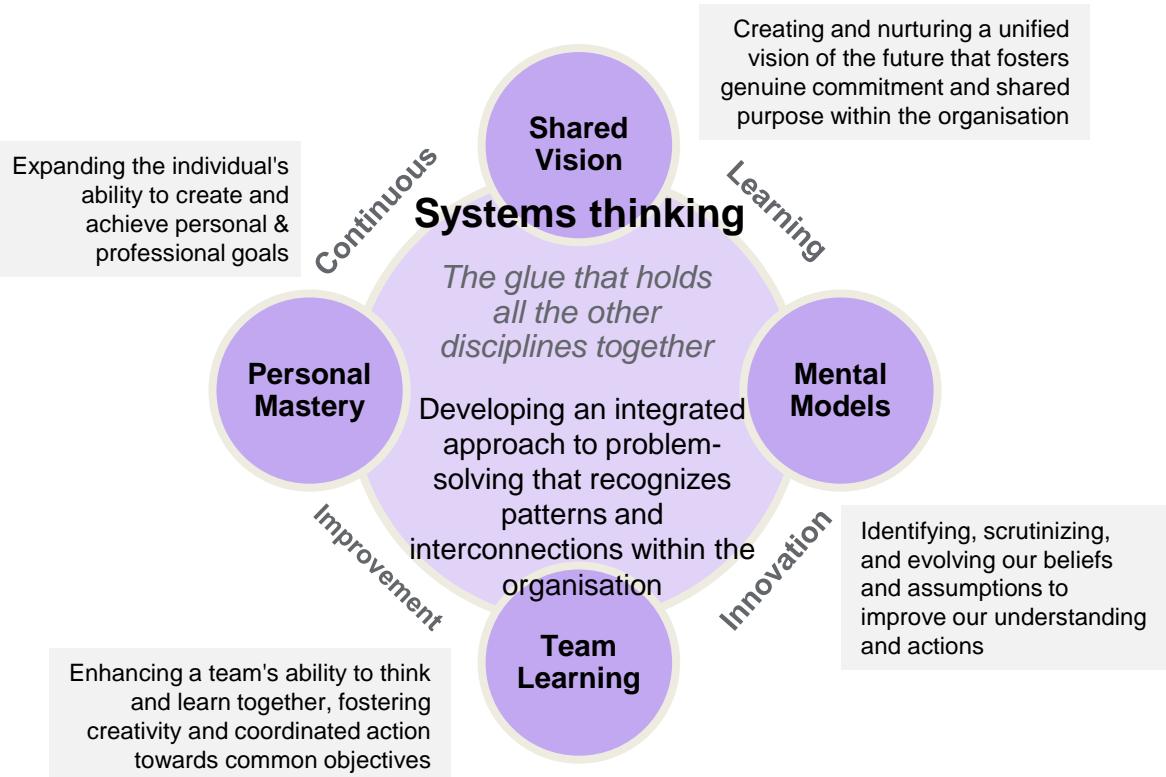
### (2) Leadership for leading change



# Building a learning organization from systems leadership

## The Learning Organisation Model: Peter Senge | The Fifth Discipline

- Peter Senge – has systems thinking at the centre of the model as the ‘glue’
- Learning as the biggest lasting differentiator
- Systems leadership – works to a shared vision and beliefs; employs shared disciplines from team learning and personal mastery in systems thinking; works on a shared solution



## Systems leadership for change (2)

<b>The three gaps – opening minds, hearts and will</b>	<p><i>There are three “openings” needed to transform systems: opening the mind (to challenge our assumptions), opening the heart (to be vulnerable and to truly hear one another), and opening the will (to let go of pre-set goals and agendas and see what is really needed and possible). These three openings match the blind spots of most change efforts, which are often based on rigid assumptions and agendas and fail to see that transforming systems is ultimately about transforming relationships among people who shape those systems.</i></p> <p>This makes it clear that transformational change and systems leadership should have some close links. And from there the gateway to change is through creating safe space.</p>
<b>Conditions for change</b>	<p><i>In re-orienting strategy, system leaders focus on creating the conditions that can produce change and that can eventually cause change to be self-sustaining. System leaders work to create the space where people living with the problem can come together to tell the truth, think more deeply about what is really happening, explore options beyond popular thinking, and search for higher leverage changes through progressive cycles of action and reflection and learning over time. Knowing that there are no easy answers to truly complex problems, system leaders cultivate the conditions wherein collective wisdom emerges over time through a ripening process that gradually brings about new ways of thinking, learning and conversing (the TLC) turned into acting and being</i></p> <p>Again the question is about how. And a big piece will be tools and ‘scaffolding’.</p>
<b>How tools are transformative</b>	<p><i>Fortunately, a rich set of tools has emerged from diverse fields over the past few decades for developing these core system leadership capabilities. The tools that matter have two functions: they produce practical benefits and they affect how people think and see the world. As the inventor Buckminster Fuller said, “If you want to change how a person thinks, give up. You cannot change how another thinks. Give them a tool the use of which will gradually cause them over time to think differently”.</i></p> <p>That tool comment is right on point. In superteams we talk of the scaffolding for teamwork which definitely includes tools like scenarios, horizon scanning, beliefs work, post-mortem and pre-mortems, etc.</p> <p>The last section provides some personal pointers to how strong leadership can emerge.</p>
<b>Working together</b>	<p><i>We know of no examples where effective system leaders achieved broad scale success without partners. You need partners who share your aspirations and challenges and who help you face difficult changes while you also attend to your own ongoing personal development—balancing task time with time for reflection, action, and silence.</i></p>

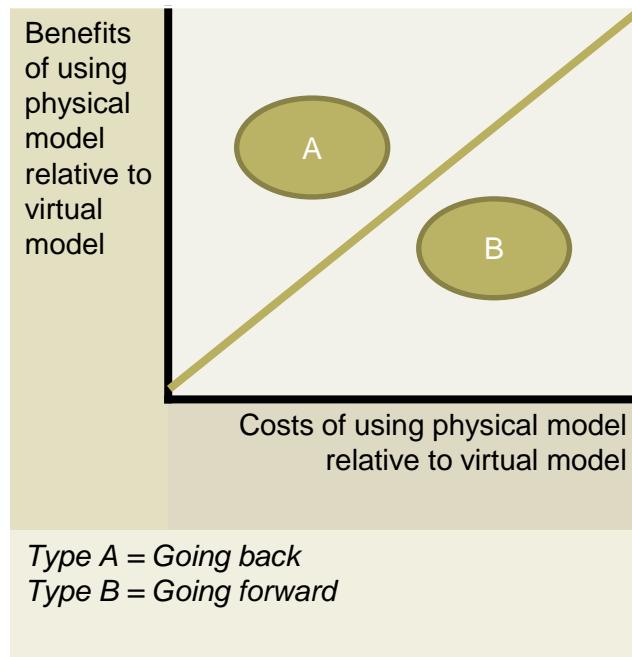
# High level framing of systems leadership to address complex challenges

Four principles below summarise the application of systems leadership in addressing investment challenges

<u>Convene to recontextualise the problem as a <u>shared</u> one</u> <b>C</b>	<u>Deepen the <u>shared</u> understanding</u> <b>D</b>	<u>Engage to work on a <u>shared</u> solution</u> <b>E</b>	<u>Solve the problem to <u>shared</u> benefit all</u> <b>S</b>
			
Consider your part and others' parts in the 'ecosystem' and the problem and engage in solving it <ul style="list-style-type: none"><li>- <i>Convene across the stakeholders that face the challenge</i></li><li>- <i>Agree the issues</i></li><li>- <i>Recontextualise self-interest</i></li><li>- <i>Create psychological safety.</i></li></ul>	Reach understanding of the problem's breadth and depth <ul style="list-style-type: none"><li>- <i>Be T-shaped, think deeply</i></li><li>- <i>See the problem through multiple lenses</i></li><li>- <i>Develop a deeper shared understanding of the issues</i></li></ul>	Co-create possible solutions working in engagement with your partners <ul style="list-style-type: none"><li>- <i>Be collaborative</i></li><li>- <i>Use solidarity</i></li><li>- <i>Build a coalition around a solution package that everyone is OK about</i></li></ul>	Reach solutions that create value and well-being at the system-level (and for all) <ul style="list-style-type: none"><li>- <i>Achieve system gains and private gains</i></li><li>- <i>Communicate how the solution package aligns with better stakeholder outcomes</i></li></ul>

## Case study 2: Application to future of work: The virtual-physical trade-off

Producing good results in hybrid design and execution is a great case study in systems leadership



Systems theory	System consequences
Flux is everywhere	<ul style="list-style-type: none"><li>The future of work situation is very fluid, is still changing and not settled</li></ul>
Everything connects but nothing adds up	<ul style="list-style-type: none"><li>Collective action problem in the face of multiple personal issues</li><li>Type A = we are going back to (previous) workplaces vs</li><li>Type B = we are going forward in work practices</li></ul>
Data is messy	<ul style="list-style-type: none"><li>The mix of soft and hard data. E.g. physical costs are hard, physical benefits are soft</li></ul>
Collaboration is critical	<ul style="list-style-type: none"><li>Teams as the unit of value creation. Social capital is the key value multiplier within teams</li></ul>
Behaviours matter	<ul style="list-style-type: none"><li>Same where possible different where necessary principles</li><li>Giving individuals agency is part of culture</li><li>Leadership style is part of culture</li></ul>

# Systems Leadership Summary

## ‘WISDOM’ – what I should do on Monday



# The big reset

<b>Systems leadership</b>	<ul style="list-style-type: none"><li>▪ Mindset shift, to work in such close collaboration, to find shared benefits</li><li>▪ To build traction there needs to be a story, a theory and some figures</li></ul>
<b>Aligning purpose, vision, and strategy</b>	<ul style="list-style-type: none"><li>▪ Organisations have weak alignment</li><li>▪ Socialisation is time-intensive but results-intensive</li><li>▪ There are always moments to relitigate the mix</li></ul>
<b>Evolving board practices</b>	<ul style="list-style-type: none"><li>▪ Deepening the communications with stakeholders about key issues</li><li>▪ Reinforcing the apolitical mandate of the fund but working with the growing likelihood of a bigger political context</li></ul>

# There is a quiet revolution coming here...

**Systems theory and systems leadership**  
are critical tools for our institutions to use and should be a central paradigm supporting sustainable investing

## **Total Portfolio Approach**

is the thought partner to the systems-theory paradigm of investing using the hyper-integration of multiple decisions to align with fund-specific goals

## **3D Investing**

(Universal Owners) are the institutions best-placed to benefit from this thinking and approach premised on culturally adapting to this way of thinking and acting

# Some changes are needed

Changes to thinking		Changes to investment practice		Changes to leadership	
<b>Systems thinking</b>	Recognise systemic risk Apply systems thinking	<b>Adapt to systemic risk</b>	Adapt to lack of meaningful data Incorporate 3D investing	<b>Adapting the mindset</b>	Triaging problems: problems, wicked problems and super-wicked problems
	See risk through multiple lenses. Think of risk in wider, softer terms Adopt total portfolio thinking		Develop organisational resilience Build resilience from awareness		<b>Systems leadership</b> Applying systems leadership selectively and coherently
<b>Narratives &amp; numbers</b>	Balance between data and narrative Respect the limits of data inference	<b>Build in robustness</b>	Extend portfolio-level scope Extend system-level scope	<b>Promotion of systems leadership</b>	Socialising the methods and the results of systems leadership

## Takeaways from systemic leadership

Socialise understanding. Reset leadership in the portfolio, sustainability and org model

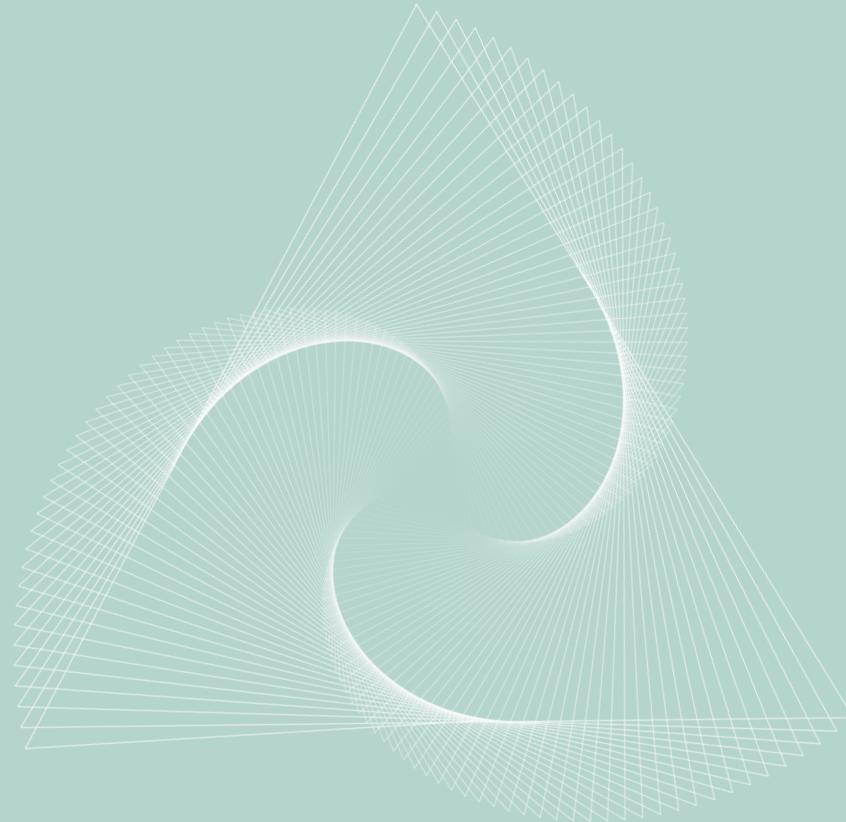
BaU – Business-as-Usual	BbU – Business-beyond-Usual
1A. Socialise understanding of leadership styles	2A. Build systems leadership into TPA , 3D investing and internalisation models

# Where next? Systems innovation

Source: *Leadership and Systemic Innovation* | Laszlo | 2018

<b>Alexander Laszlo work on systems innovation</b>	Alexander Laszlo's work has both personal and industry significance for us. We took three things from it <ul style="list-style-type: none"><li>– the framing of systems-thinking and specifically how innovation should play a bit part in systems evolution;</li><li>-- the continuum of controlling, influencing and experiencing systems outcomes – some blend of acceptance and some activism needed</li><li>-- the state of coherence we are in with the system, where we can think narrowly (selves) but have opportunities and upside with thinking more broadly, expansively and imaginatively; and this latter state is a more optimistic answer to the anthropogenic existential spectre</li></ul>
<b>Innovation</b>	The focus on innovation is helpful in defining the concept as the space between the invention of an idea and diffusion; and suggesting this could be any tool or technique, any physical equipment or method of doing or making, by which human capability is extended. The potential to foster a positive VUCA world — one based on Vision, Understanding, Collaboration and Agility also resonates
<b>Protopian visions</b>	Staying practical he calls out a focus on protopian visions (but easier said than done?) <i>Protopian scenarios serve as systemic nurturance frameworks for the design and curation of socio-technical systems that are evolutionarily viable, actionable and attainable.</i> <i>Those who wish to engage in such processes of systemic innovation immerse themselves in, and help to create, ecologies of new ways of researching, developing and innovating socio-technical solutionatiques that embody social values, technological creativity, economic opportunity, and environmental integrity.</i>
<b>The states of controlling, influencing, experiencing</b>	'We cannot direct the wind, but we can adjust the sails'. <i>This is learning to sail the currents of evolution — not just to 'go with the flow' but to become active participants in the journey — this is at the heart of the ESD (evolutionary systemic design)</i> <i>Both individually and collectively, we can learn how to have change happen through us, not to us!</i>
<b>Good problem summary</b>	<i>Even a cursory glance at the impact humankind is having on the life support systems of Earth makes patent the unsustainability of contemporary cultures of individualism and self-entitlement. Creating a new culture through an ethic adapted to our time is not a quest of foolish arrogance – it is the survival imperative for sustainable co-existence of humankind with planet Earth.</i> This spectre seems to be 100% reasonable, but only about 5% accepted. So what is the transformational change that is actionable and attainable? This is a bit more hazy, not surprisingly

## Resources section



## Takeaways from systems primer – wisdom\*

Having a system for balancing business-as-usual with business-beyond-usual

BaU – Business-as-Usual	BbU – Business-beyond-Usual
1A. Look out for systems angles – the mindset change, the growth	2A. Starts with socialising and learning new thinking. Systems Curriculum, other resources**, take the test***
1B. Systems leadership is a system of leadership that can be widely applied starting now	2B. Undertake beliefs work. Investment beliefs and values. Organisational beliefs and values

\* 'Wisdom' = What I should do on Monday

\*\* Note reading options, Meadows, Senge, Donaldson

\*\*\* Take the test – are you a systems thinker?

Systems thinking as one part wiring, one part study, one part practice

## Takeaways from systemic risk

Socialise understanding. Reset modelling. Deepen resilience.

BaU – Business-as-Usual	BbU – Business-beyond-Usual
1A. Socialise understanding. Some structured learning	2A. Remodel the risk budget to integrate systemic risk allowing for the low-provenance
1B. Socialise the wider, softer, longer principles	2B. Evolve the scenarios and theory of change. Build out the intelligence stack. Develop the resilience

# The big Peer Study takeaways – the key subjects getting attention

## #1. Complexity

- You need a system to manage a system
- Complicate to understand but simplify to act
- Peak busy with BaU leaves BbU (Business beyond usual) falling short
- Build propositions and situational awareness through beliefs

## #2. Risk2.0

- The dawning of a Risk2.0, with risk understood wider, deeper, longer
- Risk is not a figure, it's a multi-faceted concept
- The rise and rise of systemic risk headed by geopolitics & climate
- Managing risk, robustness and resilience

## #3. Soft stuff

- The soft stuff is the hard stuff
- Seven superpowers in identity & strategy; culture, governance & leadership; talent & tech
- Soft data is predominant in this domain, RAG analysis is preferable to hard figures
- Culture premium of teams and teamwork

## #4. Internalisation

- What gets measured gets managed, most of what isn't measured can be
- Cost and value are not close in time, space & provenance
- Internalisation has a sweet-spot dictated by optimal co-competition
- Privates are challenged by total portfolio thinking

## #5. TPA

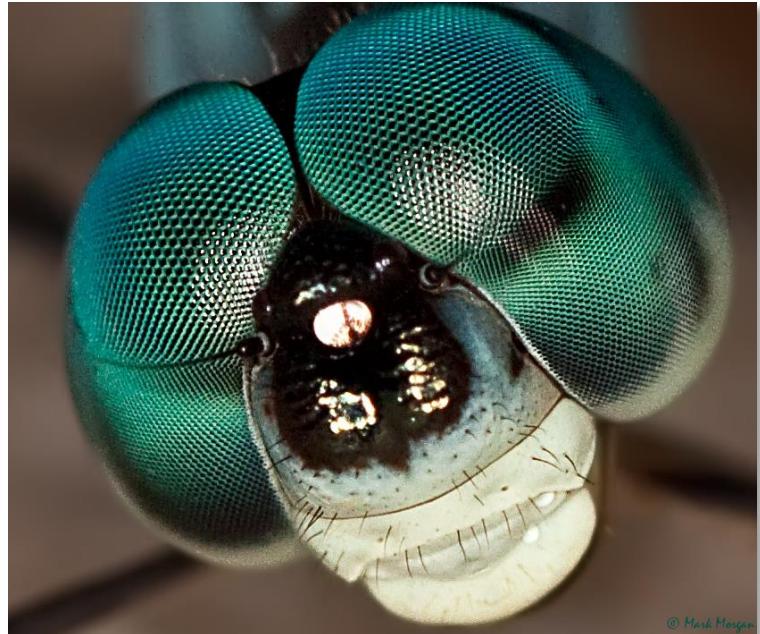
- The TPA S-curve has 'crossed the chasm'
- Investment optimising (TPA) beats governance satisficing (SAA) but TPA governance is hard
- TPA is whole fund, one goal, joined-up, dynamic
- Portfolio scorecards for coverage of investment efficiency, diversity, resilience

## #6. 3DInvesting

- The returns we need must come from a well-functioning system
- 3D investing provides air-cover to fiduciary duty
- Strategic tilting + sustainability solutions + systemic stewardship
- 3D investing supports and is supported by identity

## Multiple lenses – dragonfly eyes

- The challenge is to build better perspectives and take better decisions by reducing blind spots and enhancing the accuracy of our vision
- The best way to reduce our blind spots is to change our perspective
- Think of each new perspective as a model and a lens through which you can see the world. Models simplify the world into useable chunks



Dragonfly eyes have 30,000 lenses

# Systems and systems thinking

## Define your terms

**Connecting dots** - seeing wholes as *inter-connected not isolated parts*

**Recognising patterns** - seeing moving patterns not static pictures

**Socialising solutions** - seeing solutions through a *collective not individual effort*

### The definition of systems thinking in Arnold & Wade (2015)

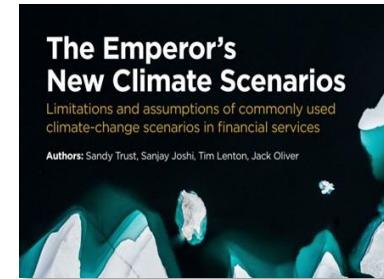
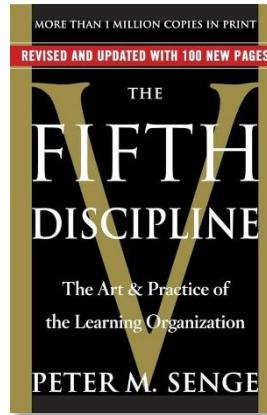
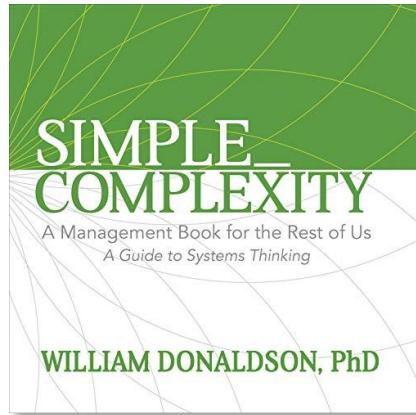
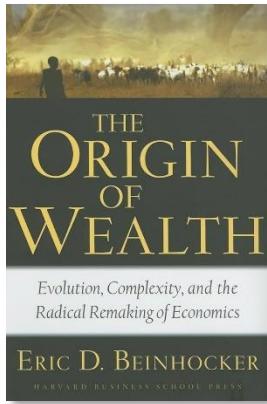
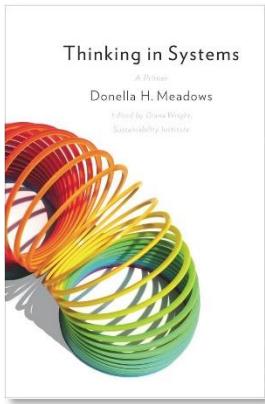
*Systems thinking is a set of synergistic analytic skills used to improve the capability of identifying and understanding systems, predicting their behaviours, and devising modifications to them in order to produce desired effects.*

*The system is defined as a collection of elements that are inter-connected and fulfil a certain purpose or function.*

### Three key characteristics

- Each system has its elements, its purpose or function, and, often, associated goals. The elements in the systems and the systems themselves are linked through various interconnections, some intended and some not
- There is no single system; there are multiple systems of which we are a part. These systems overlap and have a hierarchy, and some systems contain other systems
- Systems are always changing; they add new elements, lose old elements, change their interconnections, and evolve different functions. These systems are always adapting to changing circumstances hence *complex adaptive systems*.

# Book list and resources



 Santa Fe Institute  
<https://www.santafe.edu> ::

**Santa Fe Institute: Home**  
Welcome to **Santa Fe Institute**.

 Farnam Street  
<https://fs.blog> ::

**Farnam Street**  
Timeless lessons and insights that help you think better, learn faster, and make smart decisions.

# Are you a systems thinker?

Take this Institute survey

**Thinking Ahead** Institute  
An innovation network founded by WTW

# Are you a systems thinker?

The survey has 25 questions and should take 10 – 15  
minutes to complete

TAI will treat all responses confidentially and results will be provided  
in aggregate only. All voting is indicative and informative. TAI will  
use these polling results as inputs to our work.

[Take the survey](#)

<https://areyouasystemsthinker.scoreapp.com/>

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## **Contact Details**

Roger Urwin | [roger.urwin@wtwco.com](mailto:roger.urwin@wtwco.com)

Tim Hodgson | [tim.hodgson@wtwco.com](mailto:tim.hodgson@wtwco.com)

Marisa Hall | [marisa.hall@wtwco.com](mailto:marisa.hall@wtwco.com)