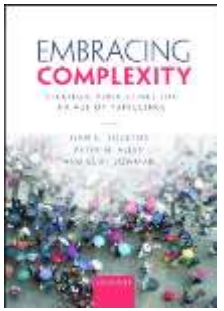

Embracing Complexity

Adapting to a complex world: implications for organisations

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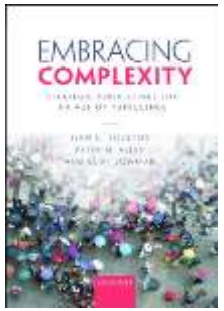
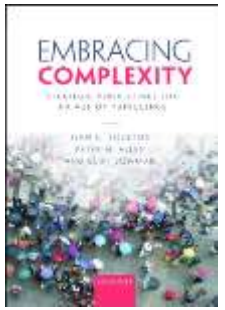


1. Science and the science of complexity
2. Have we thought like this before?
3. Why does it matter?
4. Implications for practice

Section 1: What is science?



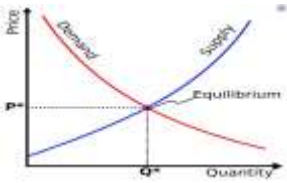
(a) Traditional mechanical science - Newton

Things work like a machine - predictable,
clear cause –and-effect links.

French Enlightenment
Theories of management
Evidence

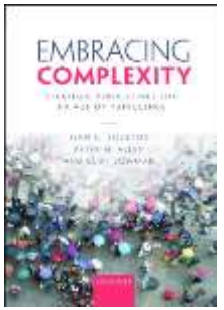
(b) Theory of gases and liquids
(thermodynamics)

Things move towards equilibrium, stay there. Entropy increases.



Classical theories of economics
'Free market' ideologies

What is science?



Are these theories relevant to social systems?

(a) Traditional mechanical science - Newton

(b) Theory of gases and liquids
(thermodynamics)

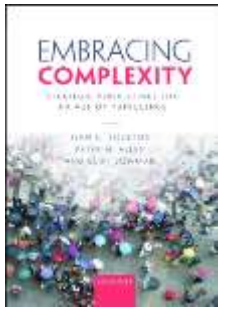
Both theories apply to closed systems (in order to do the maths..) and are about ‘what is’.

Both make simplifying assumptions (e.g. point planets, equilibrium), and are based on axioms

Both are partial – e.g. cannot explain e.g. the ‘layout’ of the universe – and the theories don’t join up

Everything just unfolds – no surprises, adaptation, nothing new.

What is science?



(c) Evolutionary science - Darwin

The future cannot be known in advance

Things emerge when something changes that suits the local conditions – it is not 'optimal'

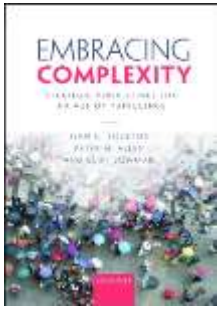
What sustains is the *system /ecology* best adapted to the local situation at the time

And the future builds on what is already there..

Change and adaptability require diversity and messiness

Cooperation (more than competition)

Darwin's approach to science..

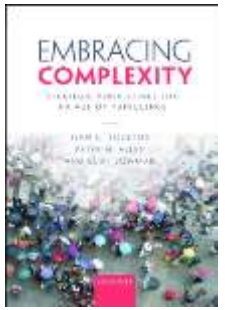


Narrative science…

Darwin's language does not close itself off authoritatively nor describe its own circumference . . .
He sought to move out beyond the false security of authority or even of the assumption
that full knowledge may be reached.
The nature of the argument led into expansion, transformation and redundancy of information.
The Darwinian world is always capable of further description and such description generates
fresh narrative and fresh metaphors which may supplant the initiating account. (Beer, 1983: 49)

'Darwin's work is the description of a process of becoming,
and such a process does not move constantly in one direction' (Beer, 1983: 65).

Complexity science – how physics explains evolution



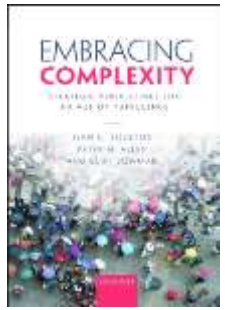
Prigogine was intrigued by the question:
'*Why does life 'mount the incline that matter descends'*
*(*Bergson 1907)

Prigogine gave an answer to Bergson's question in1947.

He pointed out that for **open systems**, entropy can decrease and order/patterns can emerge

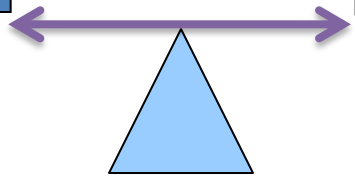
This was the start of the **science of complexity**

The nub of complexity thinking – a dance between patterns and events



Patterns - connectedness
(institutions, culture, routines, laws, political norms, supply-demand curves, **systems**, archetypes)

Disturbance to patterns
(events, chance, deliberate action, variations, shocks, shifting alliances)



Open
Nonlinear
Variation
Dynamic

The path-dependent future
systemic;
context-specific;
path-dependent;
episodic;
emergent;

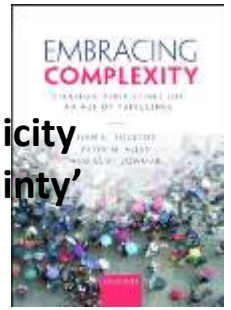
'[Complexity] begins to throw light on the basic difference thought to exist between 'science' and 'history'. In the former, explanation was believed to be traceable to the working of eternal, natural laws, while the latter provided explanation on the basis of 'events'. In this perspective ... we see that both aspects are present and that such systems are not described adequately by either 'laws' (their internal dynamics) or events (fluctuations) but by their interplay.'
Allen (1997)

The complexity of complex models

Complexity
Uncertainty

Successive Assumptions

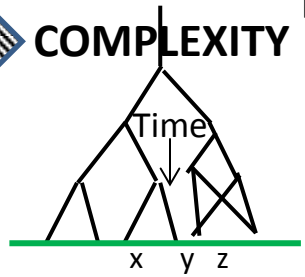
Simplicity
'Certainty'



Boundary
Classification

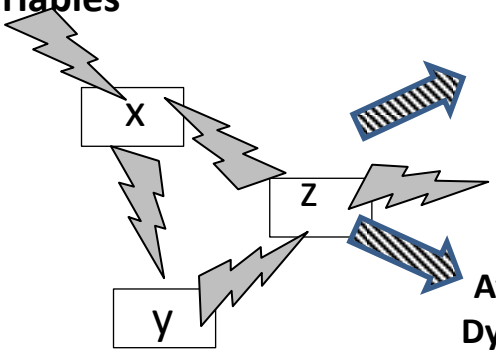
COMPLEXITY

Reality
Practice



Evolutionary
Complex Models

Structural
Stability
Fixed Variables

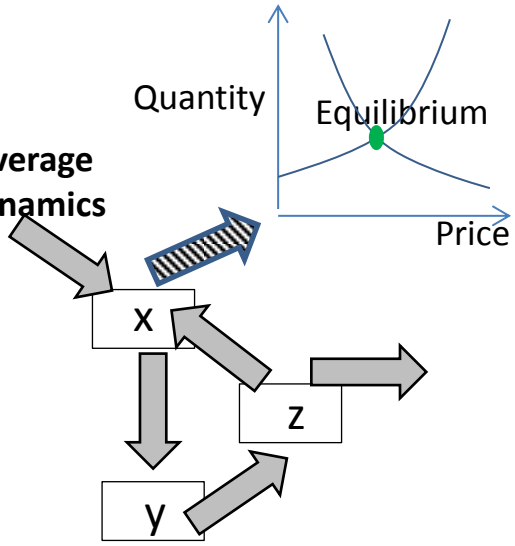


Stochastic
non-linear
dynamics.
Master
Equations

Self-Organized
Criticality.

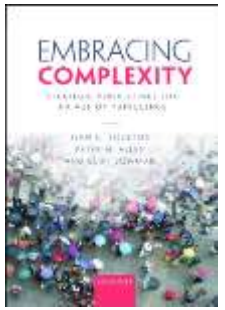
Stationary
Probability

Average
Dynamics



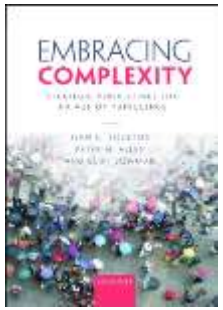
Deterministic
non-linear
dynamics

The science of complexity; its ontology



- Systemic: everything is connected
- Context specific: each situation is unique
- Path dependent: history matters; what happens depends on the particular sequence of events that has led to the current situation.
- Episodic: change goes in 'fits and starts' - how resilient is the current situation to events/chance/actions/wider change.
- Limits to knowledge: what emerges at 'tipping points' leads (generally) to form/pattern (is not random) but such patterns/form not permanent and what emerges cannot be known in advance.

2 Have we thought like this before?



Upon those that step into the same rivers different and different waters flow…They scatter and …gather…come together…and flow away…approach and depart
Heraclitus

Emptiness

'*there is no self-defining discrete reality to cause or effect. Forms or feelings are devoid of inherent existence; it is only on the basis of aggregation of subtle elements that forms exist; form can only be understood in relational terms to their constitutive elements.'.*
Dalai Lama explaining Milarepa Buddhist text, April 2008

The law of karma spells out that everything has its implications, everything makes a difference..
Every moment we are presented with the possibility of changing the future
Lama Surya Das – Awakening the Buddha within

Dao de Jing

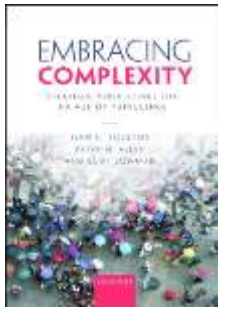
Within the rhythms of life, the swinging gateway opens and novelty emerges spontaneously to revitalise the world

…..whatever is most enduring is ultimately overtaken in the ceaseless transformation of things

Flow (becoming), emergent patterns, path dependency, episodic change

How did they know?
Is this science?

3. Why does it matter?
A belief system, not a methodology



Complexity theory is how physics explains evolution –
-the **science of open systems**
-the importance of **variation**
-a **dynamic** and **locally-emerging** theory of change

- Systemic: everything is connected
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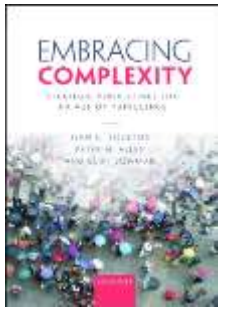
- Limits to knowledge: emergence at 'tipping points'

Why does it matter...



Complexity – not too tight, not too loose

The machine view

Standardise
Best practice
Plan
Cause and effect
Economies of scale
Reversible change

But UK 23rd out of 24 numeracy, 24th out of 24 literacy (OECD, 2013)
Current 50-60 year-olds score better than school children

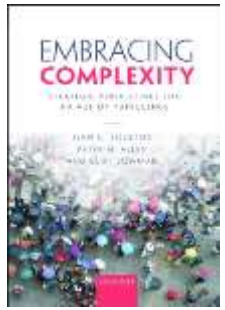
Most highly rated hospices

The 'free market' view (equilibrium thermodynamics)

Trust the market
No need for governance

But no 'trickle down'; increasing inequality,; less diversity (e.g. fewer bigger banks), concentration of power; the powerful go unregulated.
UK third worst inequality in OECD countries (2014)
Most obese people

4. Implications for practice



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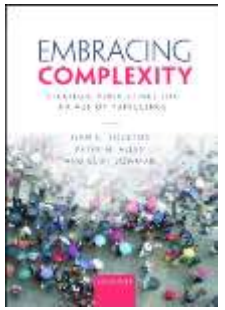

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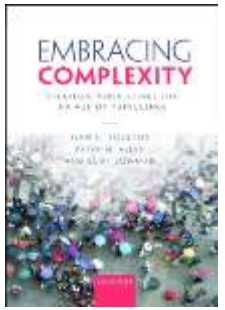
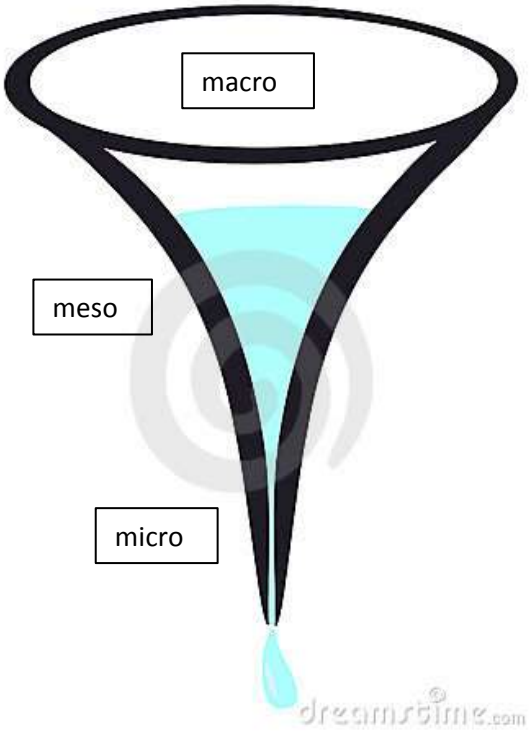
(a) Working with complexity – context analysis



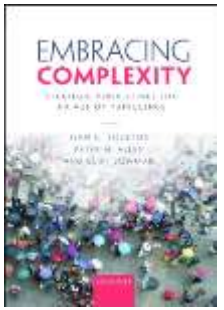
The past – path-dependent and context-specific
Explore history – events, culture, what worked, key players, current patterns/forms/power structures (org change, Syria, Unichema)



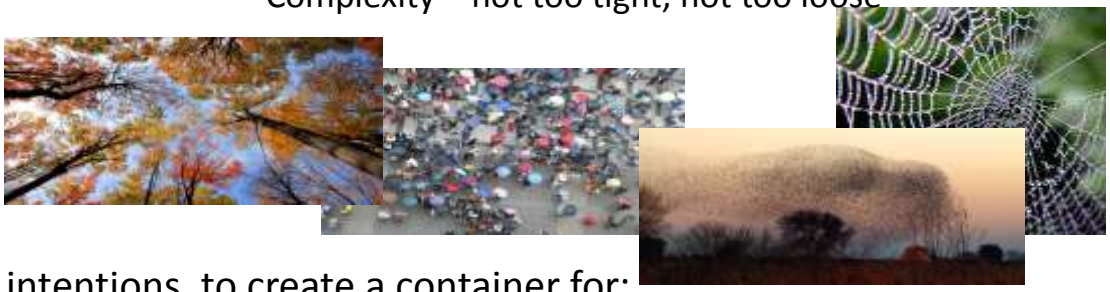
The present systemic and context-specific
Analyse wide-ranging systemic factors – PESTE
Explore macro to micro – up and down
(feed-in tariff, airport, local details matter)

The future – episodic and emergent
Look for weak signals of change
Fore-sight critical junctures
(Brazil drought, savings groups)

(b) Working with complexity; design and action



Complexity – not too tight, not too loose



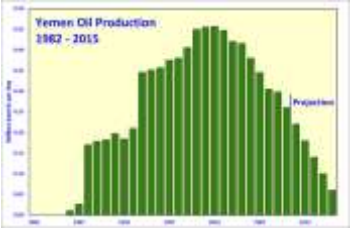
- 'Weave' intentions, to create a container for:
  - experimenting, adapting (build in 'slack'), spotting and seizing opportunities
  - share practice, but allow some customisation to local conditions

- Think systemically:
  - seek solutions that solve more than one issue – may be simpler! (waste to landfill and carbon redn)

- 'Seed' the system with good ingredients (values)

- Portfolios

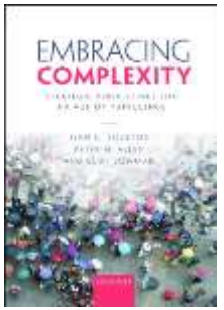
- Connect things up/build relationships (drought in NE Africa)



- 'Future proof' (Brazil PESTE, Yemen)

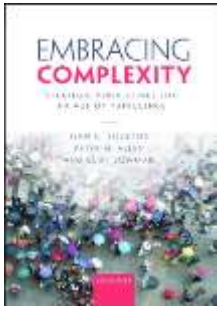
- Design adaptive organisations – economies of scale versus ability to respond to a VUCA world

(c) A really important point about 'self organisation' and governance



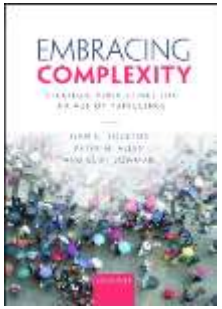
- Episodic (non-linear interactions):
  - the free market is not so free:
    - power grows and economic arguments win; dominance and lock-in
    - 'market failures' of the powerless, the environment, the long-term
  - So... need for regulatory processes, protection, global governance, 'values', (end not justify means)

Summary



- Complexity theory is the science of open systems
- It legitimates a more systemic, flexible and adaptive way of working;
- It emphasises that history, context and foresighting are critical aspects of setting and working with strategy and policy
- It is a difficult mindset change because it emphasises that we can know less and predict less and attribute less that we hoped.
- However, (I would argue) that ***Embracing Complexity*** can lead to greater effectiveness, increased efficiency and more engaged and empowered professionals...
- If the world is complex, then acting congruently with that complexity can be simpler and more effective than trying to control a machine that does not exist.

And finally...



You could buy the book...

Boulton et al (2015) *Embracing Complexity*: OUP

or browse the website and blog...
www.embracingcomplexity.com