An Introduction to the Magenta Book Supplementary Guide on Handling Complexity in Policy Evaluation

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Economic and Social Research Council

Background

- CECAN was asked to produce a Supplementary Guide for the 2020 revision of the Magenta Book, on complexity.
- *Handling Complexity in Policy Evaluation* is based on three years' research and development of evaluation methods by CECAN.
- It is published by HM Treasury and accompanies the 2020 edition of the Magenta Book, both out later this month.

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Today's *sneak peek*

Now	**An Introduction to the *Magenta Book Supplementary Guide on Handling Complexity in Policy Evaluation***
	Followed by Q&A
3:00-3:30pm	Break and refreshments
3.30pm	**Commissioning and management of complex evaluation**
4:00pm	**Selecting complexity-appropriate evaluation approaches**
4:30pm	End

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WHAT IS COMPLEXITY?

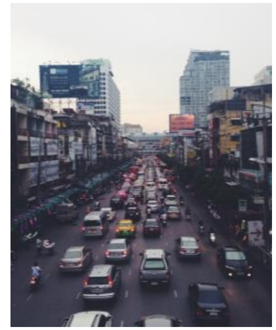
What is a complex system?

Most useful to consider complex *systems*

- **Consist of many diverse, interacting components**
- **Non-linear and non-proportional interactions between the components;**
- **Components adapt or learn in response to change**

Examples include ecosystems, economies, societies, cities, industrial networks, and the interconnections between them. All social systems are complex systems.

All policy deals with complex systems



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Simple...complicated...complex....

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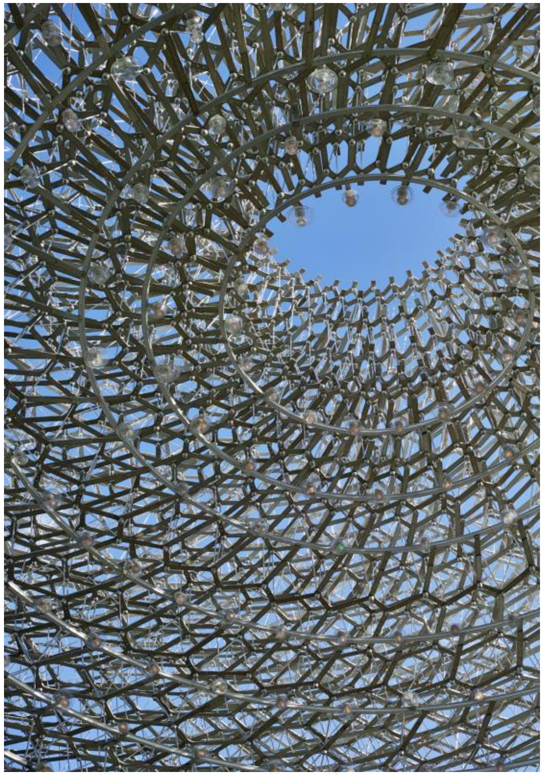
Another way of putting it…

- **"Wicked" problems** –persistent, intractable, multi-dimensional, **complex**

Complex System Policy Challenges

- Getting to **net zero GHG** emissions
- **Adaptation** to climate disruption
- Post-Brexit **land use choices and conflicts:** sustainable agriculture, housing, infrastructure, ecosystem renewal
- Post-Brexit sustainable **industrial strategy**
- New waves of **automation and AI**
- **Health and social care** in the face of all the above
- **Plus…**
- **the *interactions* between all these complex policy clusters…**
- **And their interactions with 'events, dear boy, events' – eg *coronavirus***

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Intervening in complex systems presents fundamental challenges

- Societal complex systems are *never fully knowable* –we are always dealing with uncertainty
- Complex systems are *dynamic* and adapt in response to intervention – changing the rules of the game as we play it
- *Complex legacies and path-dependency* to be dealt with
- *Predicaments* more than problems?
- We can *manage and steer* complex systems not solve or control the problems they pose
- **How should we approach all this?**

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Why this guide is important

- The challenges of – and importance of understanding – complexity
  - For policy-making
  - For evaluation
  - For cooperation and co-production of policy between agencies and with stakeholders beyond government

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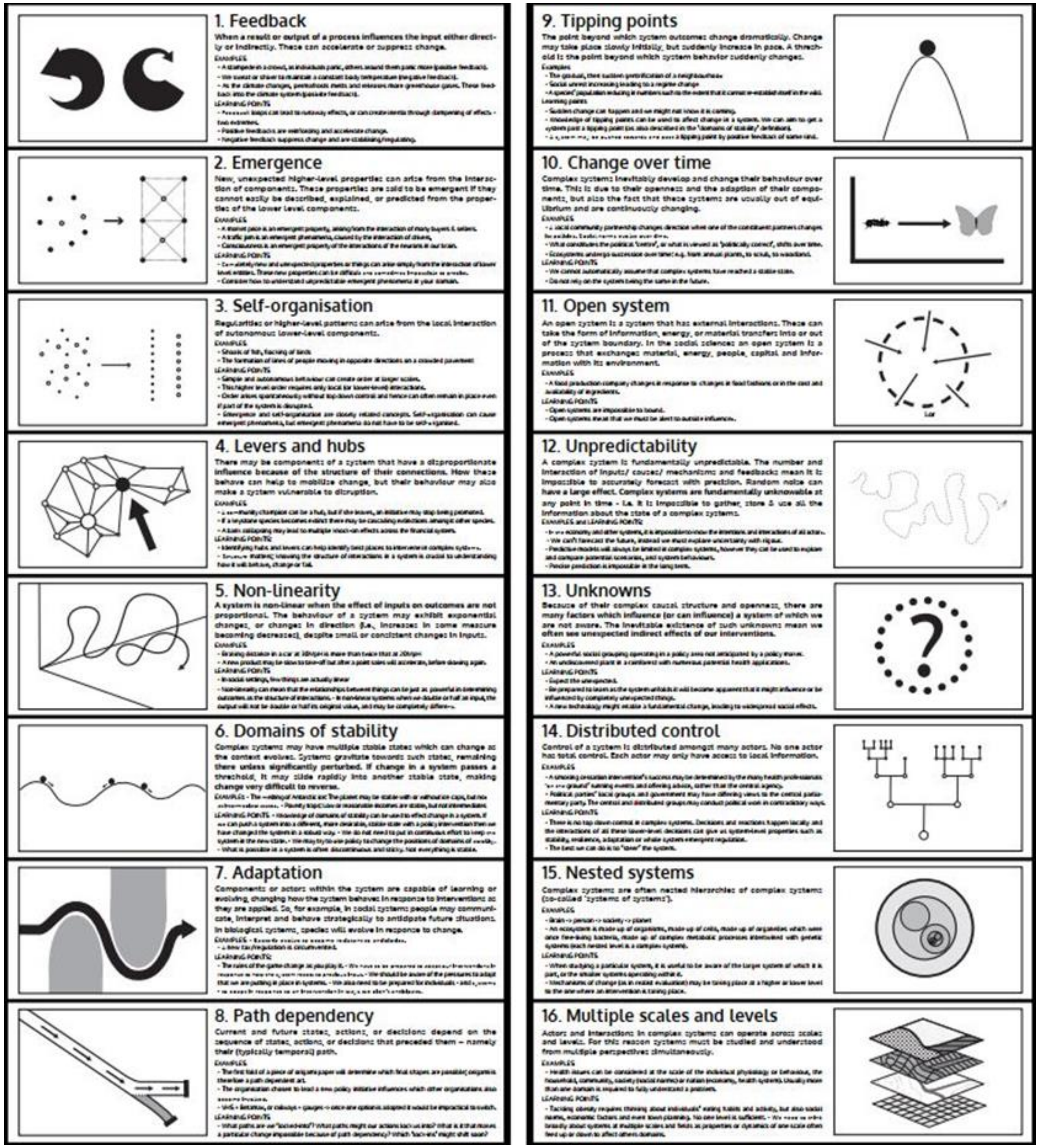
Key features of complex systems



https://www.cecan.ac.uk/news/visual-representation-of-complexity

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Some complexity characteristics

- Feedbacks
- Tipping points
- Non-linearity
- Unknowns
- Multiple scales and levels of action
- Example: climate disruption

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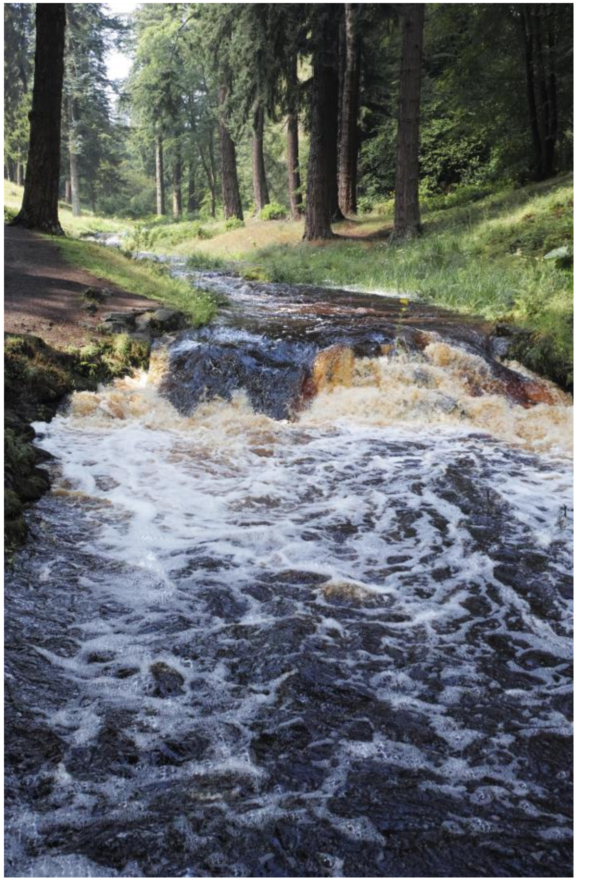
Some complexity characteristics

- Unpredictability
- Unknowns
- Emergence
- Example: climate change responses (natural solutions, geo-engineering experiments)



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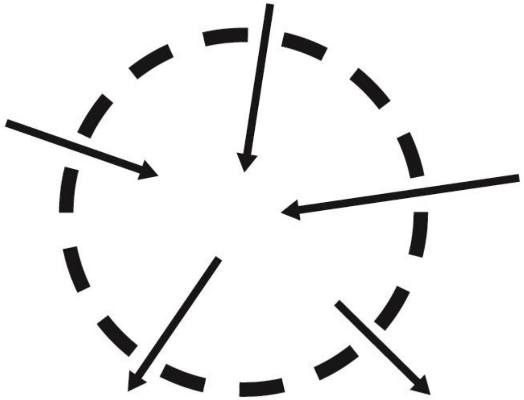
Key features of complexity:

Complex systems are open systems



An **open system** has many links and connections into its wider environment, and is affected by changes happening elsewhere.

Example ‘delayed transfer of care’: patient is ready to leave hospital, but still occupying bed. Social care system, not NHS, is responsible for substantial proportion delays: Longer stays in hospital can affect a patient’s health and impact waiting times in A&E departments and for planned surgery

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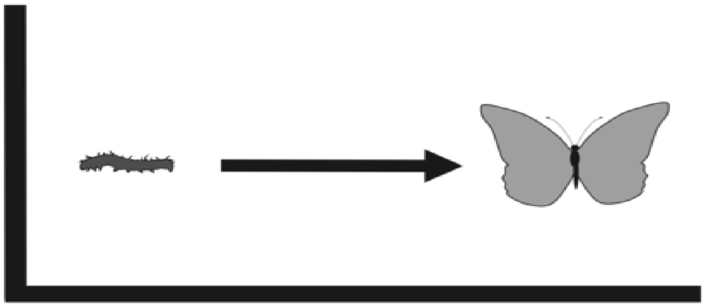
Key features of complexity:
Complex systems are constantly changing



Complex systems are in **a constant state of change.**

Example new technological and social developments constantly drive policy change. For example, social media, the mass availability and use of individuals' data within a globalized economy have led to new behaviours and business models, with huge policy and legal implications

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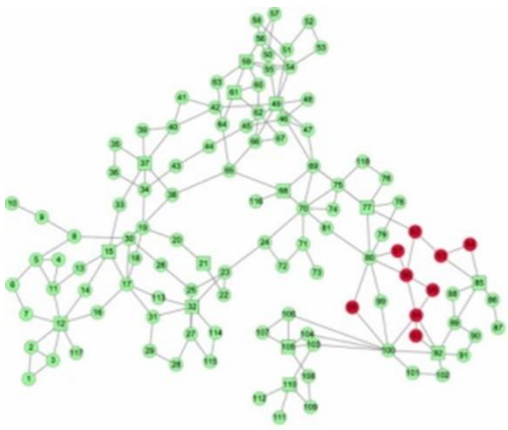
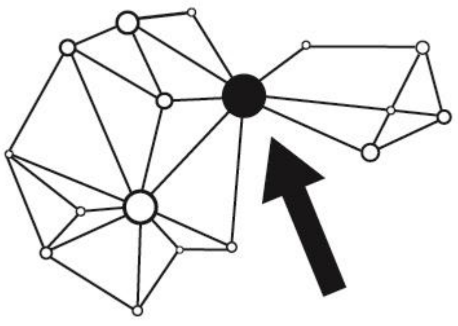
Key features of complexity:
Multiple relationships, levers and hubs



A complex system has **multiple components** – in human systems this means multiple stakeholders and multiple perspectives



Example
A well-connected and highly motivated individual or group may be mobilised to champion a particular cause. They can equally become a major obstacle to change through vetoing or blocking it.
If a 'keystone' (highly influential, but low abundance) species in an ecosystem becomes extinct, there may be cascading extinctions amongst connected species

Levers and hubs: Some components have more influence than others because of their connections.

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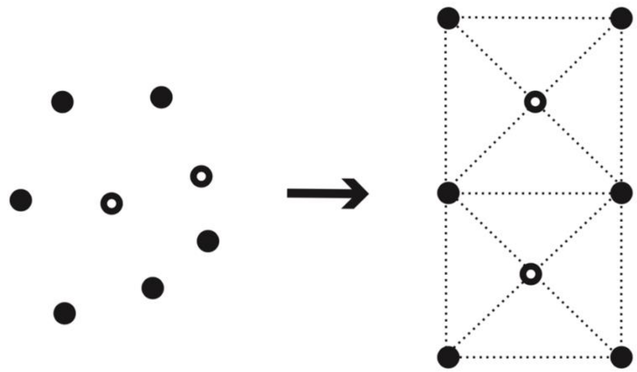
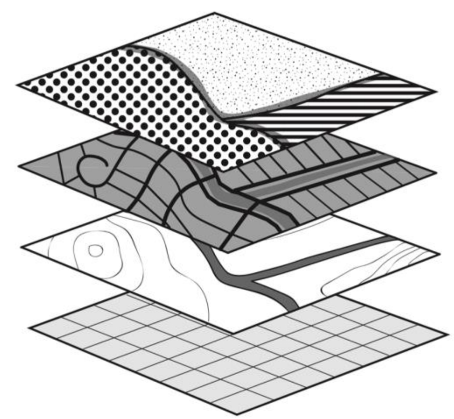
Key features of complexity:
Self organisation and emergence



Emergent properties: New, unexpected higher-level properties can arise from the interaction between the components within a system.

Complex systems are **self organising:** global patterns emerge from local interactions

Example Emergent properties can be seen in the formation of social movements, social norms and new markets
System resilience or fragility (financial systems, ecosystems) is an emergent property
Policy often aims to encourage emergence- eg market formation



Key features of complexity:
Adaptation and feedback

Feedback loops happen when one process or interaction influences the input into the next iteration of the same process. They can increase or suppress the changes taking place.

Components or actors within the system **learn and evolve**, changing the behaviour of the whole system.

Example:
Bacteria become resistant to antibiotics, corona virus passes to humans
Individuals may try to 'game the system' (e.g. by heating large number of small units to obtain a renewable heating subsidy

Example Climate change, melting permafrost increases methane emissions and global warming

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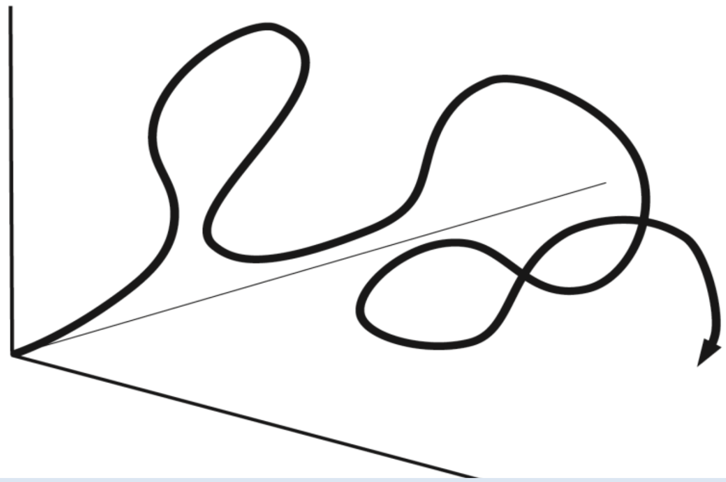
Key features of complexity:
Non-linearity



Example
A new product may be slow to take-off but after a certain point sales will accelerate, before slowing again as the market is saturated e.g. renewables

Non-linear relationship between inputs on outcomes mean that outputs are not proportional to inputs: small changes may lead to large effects in one place, but have little impact elsewhere. Sudden large-scale changes, or reverses in direction, may occur despite small or consistent changes in inputs

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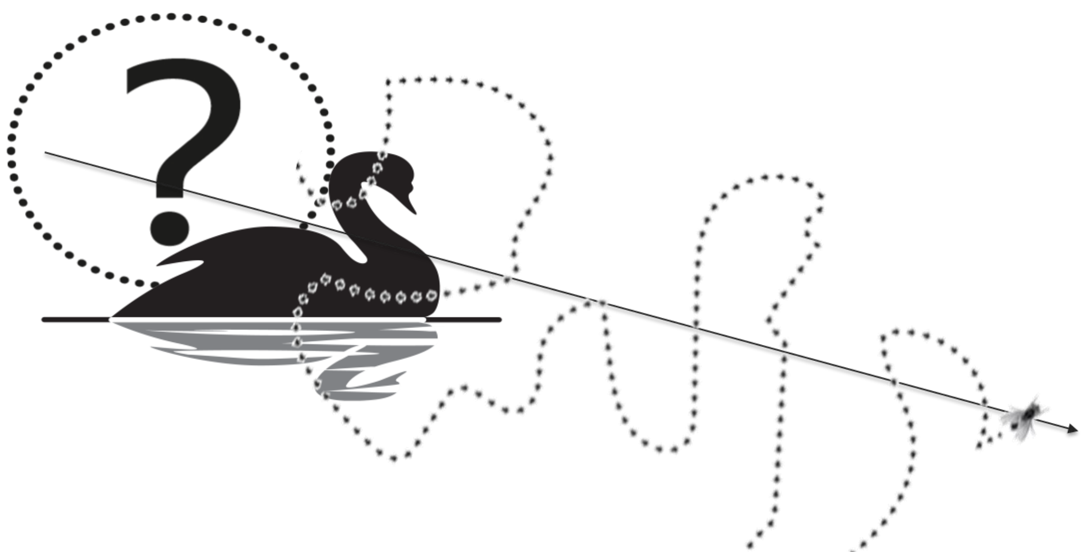
Key features of complexity:
Unexpected Indirect Effects



Example
the interaction between changing agricultural practice (increased winter planting), climate change (more extreme rainfall) and housing policy (building in floodplain) may have decreased resilience to flooding

Unexpected indirect effects Long causal chains within systems, generated by multiple interactions between components, can mean that intervention or change in one part of the system can lead to unexpected change in another, seemingly remote, component

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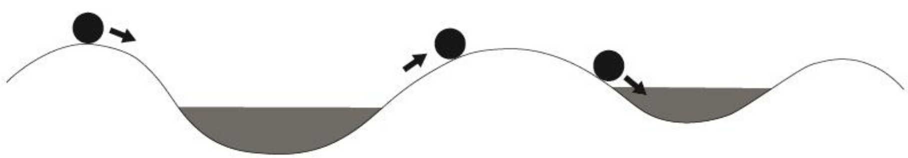
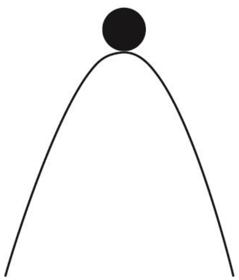
Key features of complexity:
Tipping points and attractors/domains of stability



Tipping points are the threshold beyond which a system goes through rapid change into a different state.



Systems may several relatively stable states (**attractors** or **domains of stability**) .
Changes in the wider context can cause these to evolve – moving a system from one stable state to another .

Example
Economic recessions, the existence of 'poverty traps' and the characteristics (and social segregation within) different neighbourhoods. Gradual, then sudden, gentrification of a neighbourhood, changing its demographics and character rapidly

Complex Systems Present Evaluation Challenges

Complex system challenges	Evaluation challenges
Multiple interactions and influences	• Long, **indirect causal chains** linking inputs to impacts
Systems may be in continual change, or may resist change	• Objectives, design and data requirements may **change over time** • The programme may not reach a 'final state' when the evaluation comes to an end
Openness Context (and history) matters	• Hard to establish a clear boundary **Difficult to standardise** the intervention • Outcomes may vary from one context to another
Multiple perspectives	• Need data from **multiple sources/informants**
The nature of the change is unpredictable Multiple causality	• Evaluation plans **may need to change** to address emergence of unexpected features • **New methods** may be needed for causality and attribution
Complexity is difficult to communicate	• Difficulties in communicating methodology and findings

FROM OVERWHELMING COMPLEXITY

TO

ACTIONABLE COMPLEXITY

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Magenta Book Supplementary Guide on Handling Complexity in Policy Evaluation

WHAT'S INSIDE THE GUIDE?

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Handling Complexity in Policy Evaluation

Magenta Book 2020 Supplementary Guide

CECAN has produced a *Supplementary Guide* for the 2020 revision of the Magenta Book.

The Magenta Book, published by HM Treasury, is the key UK Government resource on evaluation, setting out central government guidance on how to evaluate policies, projects and programmes. The *Magenta Book 2020 Supplementary Guide: Handling Complexity in Policy Evaluation* is based on three years' research and development of evaluation methods by CECAN. It is published by HM Treasury and accompanies the 2020 edition of the Magenta Book.

What is the Supplementary Guide and why is it important?
Complex systems are all around us. Their characteristics make their behaviour hard to predict and they present challenges to policy making and evaluation. The *Supplementary Guide* explains what complexity is, its implications, and how evaluators and policy makers can plan, deliver and use complexity-appropriate evaluation to work with this complexity.

Who is it for?
The *Supplementary Guide* is for policy makers, analysts and commissioners of evaluations, as well as evaluation practitioners including public sector evaluation contractors.

How do I use it?
The *Supplementary Guide* is designed to be used alongside the Magenta Book. It provides further guidance on how to use evaluation appropriately as an effective management tool when policies, programmes, projects, or their evaluations are particularly challenging, intractable, or *complex*.

Inside the Magenta Book 2020 Supplementary Guide —Handling Complexity in Policy Evaluation

WHAT IS COMPLEXITY
An accessible introduction to complexity and why it matters for policy-making. Describes and illustrates the properties of Complex systems with images, definitions and examples.

THE CHALLENGES OF COMPLEXITY TO EVALUATION
Illustrates why and how complexity creates challenges for evaluation, with examples.

COMMISSIONING AND MANAGING EVALUATIONS
How planning and managing can help to understand, anticipate and navigate the challenges posed by complexity. Includes a list of questions that commissioners can use to aid planning at each stage of the evaluation planning process.

SELECTING COMPLEXITY-APPROPRIATE APPROACHES
How to choose the approach or combination of approaches appropriate for a particular evaluation. Contains several useful tables including:

- Answering evaluation questions – matching evaluation questions with methods and approaches.
- Tackling different aspects of complexity – matching complexity challenges with methods and approaches.
- Circumstances affecting feasibility – exploring the strengths and weaknesses of different methods and approaches, including the specialist skills and levels of resource required.

DOWNLOAD

The Magenta Book 2020 *Supplementary Guide: Handling Complexity in Policy Evaluation* can be downloaded from:

www.cecan.ac.uk/magenta-book-complexity-guide

The Centre for the Evaluation of Complexity Across the Nexus (CECAN) is a national research centre hosted by the University of Surrey that brings together a unique coalition of experts to address some of the greatest issues in policy making and evaluation.

UKRI Economic and Social Research Council

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Inside the Supplementary Guide

WHAT IS COMPLEXITY

THE CHALLENGES OF COMPLEXITY TO EVALUATION

“what you should know”

COMMISSIONING AND MANAGING EVALUATIONS

SELECTING COMPLEXITY-APPROPRIATE APPROACHES

“what you can do”

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Magenta Book Supplementary Guide on Handling Complexity in Policy Evaluation

HIGHLIGHTS

Highlight 1:
Complexity images and examples

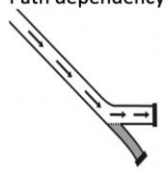
society

nature *policy*

Accessible definition

Illustrative examples

Properties of complex systems, illustrated

Property of Complex System[5]	Definition	Examples
Tipping points 	Closely linked to the idea of 'domains of stability', tipping points refer to the threshold beyond which a system goes through rapid change into a different state. It can be seen in situations in which change has initially been quite slow, but suddenly increases in pace.	• In the natural world: A forest ecosystem may be stable over a large range of average rainfall, but may rapidly become desert as rainfall decreases beyond a certain threshold • Social world example: The gradual, then sudden, gentrification of a neighbourhood results in underlying social unrest suddenly increasing, leading to a regime change and social media 'storms' in which minority opinions become the majority. • In the policy world: the sale of solar panels to householders increased very slowly over several years until suddenly taking off in response to a change in feed in tariffs and word of mouth (across neighbourhoods).
Path dependency 	The future development of a complex system depends on its history - how it got to its present state – as well as where it is currently. The order in which policy instruments or decisions are introduced may affect their cumulative impact.	• Natural world example: Evolution is a highly path-dependent process. Organisms cannot radically change from their predecessors but change and modify themselves by mutations of adaptations that already exist. This is why evolution seldom finds optimal solutions. • Social world example: The health over the whole of the lifespan of an individual can be influenced by the diet and wellbeing of their parents and the conditions under which they were born and brought up (one of the causes of health inequality). • In the policy world: The choice of an organisation to lead a new policy initiative, and their history and reputation, may have a powerful influence over the way in which the policy is delivered, and how other organisations behave in relation to the policy.

Highlight 2:
Questions for commissioners and managers

Understanding

- E.g.: To what extent does the policy or programme, or its context, demonstrate any of the features of complexity?

Evaluation design

- E.g.: Have opportunities been built in to reconsider the data collection methods, in order to accommodate any unexpected elements that might emerge during the evaluation?

Conducting the evaluation

- E.g.: Is the commissioning specification broad enough to allow for initial exploratory activities, new evaluation approaches and adaptation of these as new information emerges?

Using and disseminating findings

- E.g.: Were recipients of the evaluation findings given an indication of the complexity of the policy or programme, and how this might impact on the findings or recommendations?

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Highlight 3:
Methods and approaches tables

evaluation questions → ← methods and approaches

complexity challenges → ← methods and approaches

methods and approaches →

- feasibility 'fit'
- specialist skills needed
- levels of resource needed

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Highlight 3:
Methods and approaches tables

evaluation questions

complexity challenges

methods and approaches

Evaluation question	Approach / method	Benefits
What is important to different groups, who can champion change?	**Most significant change** **Participatory system mapping**	Most significant cha aims to clarify the va Participatory system build a system map a Structures conversat delivering change, ca If begun at the optio framework for desig piloting and full imp
What levers are generating change, what may be inhibiting change?		
	Big data and associated methods	Might ultimately allo subsequently spread Can provide near rea
How well was the policy implemented? How can this be improved?	**Participatory, adaptive approaches**	Generates trust and agents for change
Is the policy making a difference, by how	**Experimental approaches**	Provides robust evid difference, and to w
	Statistical	Weaker than experi

Highlight 3:
Methods and approaches tables

evaluation questions → ← methods and approaches

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Highlight 3:
Methods and approaches tables

evaluation questions

complexity challenges

methods and approaches

Complexity challenge	Approach / method	How it helps
Sensitivity to context	Generative causation, configurational and system mapping and modelling	Treats context as a v than a factor to be i complex systems is
Openness/ open system	System mapping	Can guide division o change into multipl programmes into m without losing sight systems and betwe environment
Multiple interactions and influences Long, indirect causal chains linking inputs to impacts	System mapping and modelling	Can capture the key guide construction of change Provides a framewo importance of relati impacts
Continual change, difficult to predict outcomes arising from e.g. feedbacks, non-linearity, tipping points, thresholds,	Computational system modelling	Provides explorator and "theoretically-i widely agreed and a agent based modell the surface)
	Predictive modelling	Computational syst

Highlight 3:
Methods and approaches tables

evaluation questions

methods and approaches

complexity challenges

methods and approaches

methods and approaches

- feasibility ‘fit’
- specialist skills needed
- levels of resource needed

Highlight 4:
Other resources

- The appendices link to further guidance and resources, including:
  - General and sector-specific resources
  - Practitioner guides and academic articles

Using the Supplementary Guide

- Who is it for?
  - Analysts
  - Evaluation practitioners
  - Policy-makers
  - Evaluation commissioners

- How and when to use it?
  - Alongside the Magenta Book
  - When policies / programmes / projects or their evaluations are complex

- Where to find it?
  - Later this month (launches on the 27 March)
  - Link on your flyer

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THANK YOU

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Magenta Book Supplementary Guide on Handling Complexity in Policy Evaluation

Q&A

- Examples of complexity challenges in policy, getting to net zero, AMR and corona virus, post-Brexit landuse, health and social care, flooding
- Essential challenges, system is never fully knowable and is in a state of constant change and adaptation
- Systems require adaptive management
- Aren’t always “solutions”, but might be steering approaches to guide system to better condition
- Managing not solving complexity
- Evaluation becomes even more crucial in this scenario
- CAS properties which connect to policy challenges and use most compelling examples
- Complexity is the norm

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