BETTER DECISIONS:
MAKING SENSE OF COMPLEXITY

The complexity of the business operating landscape has considerably increased over the past years. Understanding what environment you're working in is key to effective decision making through periods of uncertainty. The Cynefin framework, created by **Professor Dave Snowden** in 1999 and pronounced *'kuh-nev-in'*, helps with exactly that. Described as a sense-making device, Dave's framework is more relevant today than ever and is explained in detail on page 3. At a CRF Masterclass, Dave introduced the framework and discussed how to apply it effectively. The event considered questions including:

CYNEFIN GLOSSARY here

PROF. DAVE SNOWDEN is the founding Chief Scientific Officer of Cognitive Edge and Founding Director of the Centre for Applied Complexity at the University of Wales. His work covers government and industry, looking at complex issues relating to strategy and decision-making. He has held significant academic appointments worldwide and founded the Cynefin Centre for Organisational Complexity.

CYNEFIN CENTRE

How do you understand what complexity is, so you can manage it more effectively?
Understanding what complexity actually is, learning how to assess it against the Cynefin framework, and then learning how to communicate it with others is essential. Training people to communicate about it more effectively helps too – think of it as teaching people to talk to IT in IT language, rather than getting IT to talk to everyone else in layman's terms.

How do you change systems to be less complex, so highly skilled people aren't needed to make effective leaders?
By way of example, the Armed Forces may assume they will end up with mostly below-average people, but they leverage them through processes into above-average leaders. Processes that create the leadership qualities we want are far more powerful than assessing people for those qualities.

How can you have more effective transformations?
Triggering a 'transformation' will lead you to think about previous transformations, which is likely to limit your ability to imagine and implement new changes.

How do you build more effective leadership teams?
Increasing numbers of organisations are moving towards a collective leadership model over the myth of the individual leader. These may take the form of a leadership 'crew', with a designated 'pilot' but distributed decision making power and processes.

CORPORATE RESEARCH FORUM

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BETTER DECISIONS: MAKING SENSE OF COMPLEXITY

'SENSE-MAKING'

- Cynefin is one of a body of methods and frameworks in the wider field of naturalising sense-making; in other words, 'how do we make sense of the world so that we can act in it?' Naturalising refers to the use of natural science as an overall constraint on the valid use of methods and tools.
- Linking this to some broader philosophical concepts, it is generally accepted that epistemology follows ontology – in other words, once we've established what we know, we can ask how we know that information. Your executives may be assuming that complexity is solely a lack of detail or lack of effective process, which would entirely be resolvable, but we know that, in reality, some complexity is always inevitable.
- Once we accept that premise, we can start to identify the knowledge components of complexity. Most famously said by Donald Rumsfeld but credited to Luft and Ingham (1955), there are many types of knowledge, as outlined in the grid below. These are explained using the idea of the 'known' – or, things we are aware of – and the 'unknown' – or, things we aren't aware of. These words can be combined to explain the relationship between the world as it is and the world as we understand it. Some examples of each are included.

TYPES OF KNOWLEDGE

	KNOWNS	UNKNOWNS
KNOWNS	**KNOWN KNOWNS** *Things we are aware of and understand* e.g. bestselling product data	**KNOWN UNKNOWNS** *Things we are aware of but don't understand* e.g. the unarticulated needs of staff and customers
UNKNOWNS	**UNKNOWN KNOWNS** *Things we understand but are not aware of* e.g. sexist or racist biases in hiring process	**UNKNOWN UNKNOWNS** *Things we are neither aware of nor understand* e.g. potentially catastrophic risks that cannot be predicted by knowledge of the past, such as innovative cyber threats

WHAT IS COMPLEXITY?

There are three key characteristics of a complex system. For a system to be complex, it must...

1 ...HAVE A LARGE NUMBER OF ELEMENTS

a. Complex systems are made of lots of different, constantly interacting, moving parts. These might be products, teams, leaders, processes or other organisational components. This makes it very difficult for someone to have a reliable sense of all of the necessary data for decision making at any one time.

b. Trying to manage complexity at scale can result in issues like 'inattentional blindness', where people get so caught up in the minutiae that they miss important macro components. In a famous experiment, radiologists were asked to spot anomalies in a batch of X-Rays, but 83% failed to see a picture of a gorilla, 48 times the size of a cancer nodule, which was in plain sight on the final X-Ray. You can't train people not to make this error, so you have to build systems that make the 17% visible to leaders before they conform to the majority belief.

c. Most readers are going to scan about 3-5% of available data properly. How much data you personally are going to internalise is dictated by your brain's memories, your ability to pattern match, and your social biases and societal circumstances.

d. Many of our biases are actually heuristics which are dictated by our evolutionary nature – you can't train that out of people, so you have to change the systems instead to prompt people to behave differently at the relevant stage.

2 ...FEATURE MULTIPLE SHORT RANGE, GRANULAR, RICH INTERACTIONS BETWEEN THOSE ELEMENTS

a. Small or individual elements have greater fluidity and greater margin for error than big elements and combinations of elements.

b. These interactions are the opportunities for 'novel' practice within an organisation, where new ideas, innovations or changes in practice might originate. The closer the elements in the system are to each other and the richer their interactions are, the more likely it is that something potentially innovative will occur.

c. So, what's the danger? The greater the number of elements, and concurrently the greater the number of interactions between those elements, then the greater the number of unintended consequences will result from a decision made within that system.

BETTER DECISIONS: MAKING SENSE OF COMPLEXITY

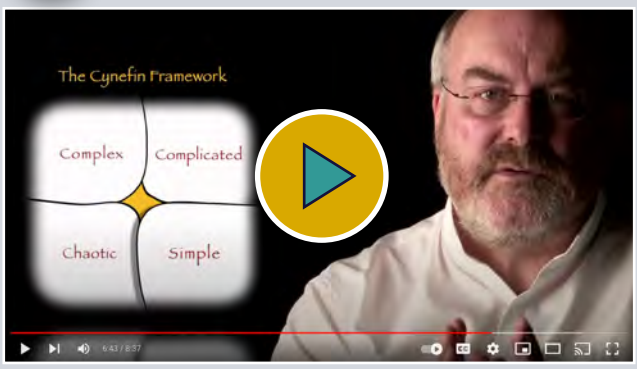
3 ...BE THE CASE THAT NOBODY IS TRULY AWARE OF THE SYSTEM AS A WHOLE

a. Complex systems feature so many elements, interacting so often and at such granular detail, that it is impossible for any one person to comprehend every detail of that system. In other words, you can't think 'holistically': it's too great a challenge, but you can observe emerging patterns.

b. This means it is often better to start off with a sense of direction, not specific goals. Often, when people are working towards explicit targets, they have lower intrinsic motivation. Instead, you can use vector goals – *"we would like to move in the direction of..."* – and introduce novelty, and new ideas, on the pathway.

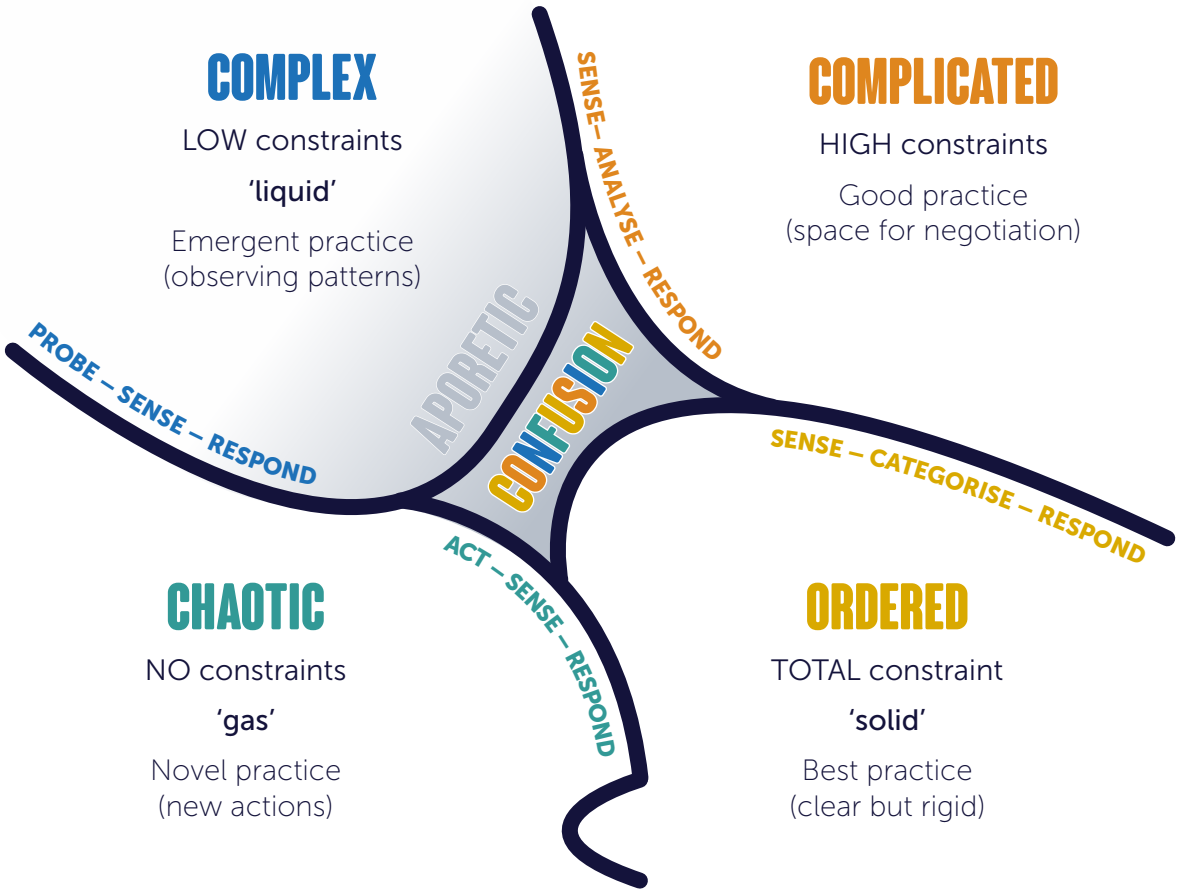
c. Snowden optimistically jokes that this process is much like a line from the children's movie 'Frozen 2' – *"all I can do is do the next right thing"*.

WATCH DAVE SNOWDEN INTRODUCTION
THE CYNEFIN FRAMEWORK



THE CYNEFIN FRAMEWORK

The Cynefin framework identifies five different contexts for decision-making, each context related to different relationships between cause and effect. Cynefin is Welsh in origin and literally translates as 'habitat', but is imbued with a broader meaning closer to 'place of multiple belongings' (geographical, social, cultural, and so on). In any situation, decisions on how to proceed, and the appropriate sequence of actions, depend on which domain you are in.



BETTER DECISIONS: MAKING SENSE OF COMPLEXITY

ORDERED

The domain of **BEST practice**. Where the relationship is not only obvious to everyone, but all reasonable people buy into the consequences and behaviour is predictable. The lower energy cost of doing something, the more likely it is to happen. For example, the UK we drive on the left, in Germany they drive on the right, but this is not absolute – if a child runs onto the road, you do whatever is necessary to avoid killing them. High tension of constraints can lead to catastrophic failure, so the conditions of the system have to be sustainable. Here, the appropriate sequence of actions is **Sense – Categorise – Respond**.

COMPLICATED

The domain of **GOOD practice**. Where the relationship can be known, but only through analysis or expertise and which may not be fully accepted by all actors. Within boundaries, there is no need to validate expert opinion – even if there are different practices. Here, the appropriate sequence of actions is **Sense – Analyse – Respond**.

COMPLEX

The domain of **EXAPTIVE practice** (radical repurposing, adaptation under stress). Complex adaptive systems are deeply entangled, everything is connected with everything else, small changes magnify quickly, and unintended consequences are the norm. Snowden gave us the analogy of *"bramble bushes in a thicket"* – if you pull one thing, the only thing you know for sure is that it will have unintended consequences, which creates ethical complexities. In this domain, we gain insight by conducting small, safe-to-fail experiments in parallel around any coherent idea of what to do next. Smaller interventions lead to less serious consequences. These systems tend to be more flexible. When the situation is Complex, the appropriate sequence of actions is **Probe – Sense – Respond**.

CHAOTIC

The domain of stress-induced **NOVEL practice**. Only ever a temporary state in any human system, but always stressful. However, for those able to react quickly and appropriately, a domain where considerable change is possible. In Chaos, it's important to take decisive and confident action, even if it turns out to be wrong later. The appropriate sequence of actions is **Act – Sense – Respond**. The role of the leader is to build stability. Leaders need to act while keeping options open. Used deliberately, it also allows distributed decision-making using whole of workforce engagement. No effective constraints exist, which will only be temporary. Use employees on the front line as a sensor network for chaos.

APORETIC

The central and starting domain for use of Cynefin. Entered accidentally this is a disaster, but entered deliberately it is a state of suspended disbelief from which actions in the other four domains can be initiated.

REMEMBER

- **Water doesn't hit 100 degrees and become steam – it needs additional energy to be added to create a 'phase shift'. It costs less energy to shift 'down' (ordered -> complex) than to shift 'up' (complex -> ordered).**
- **The best decisions in 'chaos'/crisis are those that don't necessarily make decisions to 'solve' the problem but do make decisions, that leave options open. Leaders need to be able to make decisions confidently, because novel solutions or tangents of solutions will emerge as decisions are taken.**
- **If in doubt, assume it's complex. Alternatively, if the evidence supports conflicting hypotheses and you can't resolve which is right within the time frame of a crisis, it's complex.**

LIMINALITY

- Liminality is defined as the suspension between states of being during a transition, like the ambiguous moment between being asleep and being awake. Ambiguity is the quality of being open to more than one meaning or interpretation, which can also create a kind of liminality as one transitions back and forth between meanings or interpretations.
- In the Cynefin framework, this most commonly describes when an organisation moves repeatedly between being a 'complex' system and a 'complicated' one. This involves testing new changes, moving between states, and allowing for changes in practice.
- During these transitions, there may be more or less helpful outcomes from the processes you undertake.
  - A causal factor is an event or condition in the process sequence that contributes to an unwanted result. For example, a lack of supportive social relationships may be a causal factor in the development of depression – a person might still become depressed even if they have supportive social relationships, but it is likely to negatively contribute to the situation.
  - An emergent process is a non-routine business process whose execution is guided by the knowledge that emerges during a process instance. A non-emergent process uses a recipe: you follow all of the instructions in the process regardless of who you are or what context you are in. These tend to be simpler, lower level processes, like 'pay the suppliers'. An emergent process uses the brain of a chef: what steps of the process you follow depends on your knowledge, experience, and assessment of the needs and context of the situation. These are the more complex, higher level processes, like 'develop the strategy'.

- The important difference between causal factor and emergent process, is that processes that create the qualities we want are more resilient and scalable than choosing the qualities we want in the beginning.
- In his book, *Thinking, Fast and Slow* (2011), Daniel Kahneman reminds us that stress on a system triggers the change that creates novelty, moving us away from autonomic thought and into a space that can hail innovation.

THE POWER OF NETWORKS

- Informal networks can be significantly more effective at creating novelty – rich interactions between closely situated elements – but organisations tend to prefer formal networks, which hold things at a distance.
- Formal networks need to accommodate for 'managed serendipity', where people pay attention to unexpected connections.
  - These are often the sites of innovation. The Raytheon company credits the discovery of microwave cooking to a grade-school-educated engineer named Percy L. Spencer. One day in 1945, Spencer was walking through a radar test room with a chocolate bar in his pocket; he came too close to a running magnetron tube and the chocolate began to melt. He then tested his theory on eggs and popcorn and went on to invent the microwave oven.
- During the COVID-19 pandemic, people reported using their informal networks more because they trusted them more than their formal networks based on past practice. The pandemic was so profoundly disruptive to notions based on past practice that they no longer felt reliable to use. As a result, a learning from this period has been that dense informal networks help to solve a significant number of organisational issues.
- One of your people KPIs should be the density of your informal network: 'everyone within two phone calls of everyone else' as a measure of organisational health. According to Snowden, trust extends to three degrees of separation before it breaks down.
- Silos can help people to feel comfortable to work with others in detail. However, increased informal networks can help tackle acute siloing, to create cross-discipline communication. When someone has a problem, it gets picked up and dealt with quickly and easily.
- This where the 'aporetic' domain comes in most useful: this 'necessary ambiguity' of states is needed to keep flow and allow organisations to make changes without committing to them.
  - Snowden used the example of company values: by stating them, you bias people towards them and they will end up changing the way they behave towards you, hoping that you will notice that they are using the explicit values you said you wanted to see. He paraphrased this as, *"the more explicit you are about what you want, the less you can trust what you actually receive."*
- One of the most powerful qualities of strong informal networks is that they can act as a sensor for 'weak signals' throughout the organisation. For major issues, the signs of failure are often there long before the company dies (Snowden says, think Kodak) and strong informal networks can pick these up long before more formal data will reveal them.
  - The optimal outcome is 'weak signal detection' without interpretation – this avoids intermediation, or 'middle men', who might bias the signals before they reach leaders.
    - These weak signals can be about the failure of business strategy, safety concerns, discrimination, evidence of fraud, and so on.

CHANGING DISPOSITIONS

- According to Snowden, concepts like 'mindset' and 'mental models' don't apply to human beings. Computers can have these, but we can't – instead, many of our behaviours and thought processes are still fundamentally dictated by our evolutionary instincts and by key elements of the Cartesian theory of consciousness (e.g. the body and nervous system, the brain, and by our individual social context).
  - Moreover, in a strange parallel, AI and similar programs are more affected by the data sets they are trained on than by their algorithms. If an AI is fed data that is centred on a straight white male perspective (as they statistically are likely to be), then that acts as a kind of social context and will have a huge impact on the results of the data. This bias is a 'known unknown' (see above).
- Whatever has the lowest energy gradient will win, physics tells us. Whatever uses energy most effectively will survive, evolution tells us. All organisations can do is change people's dispositional state and monitor the impact.
- What this means is that changing peoples' behaviours within an organisation will ultimately come down to plotting the energy cost (attention, money, resources) of making that change against time, in a graph like the one on the following page, known as an 'estuarine map'. See also Kurt Lewin's change equation, which makes a similar point.
- Estuarine mapping is a Cynefin tool that can be used to determine a direction for change, when organisations are struggling to determine what their next steps should be. This was developed as a counter to traditional approaches to strategy that are fixed in nature and reflects the key principles of change in a complex environment:

BETTER DECISIONS: MAKING SENSE OF COMPLEXITY

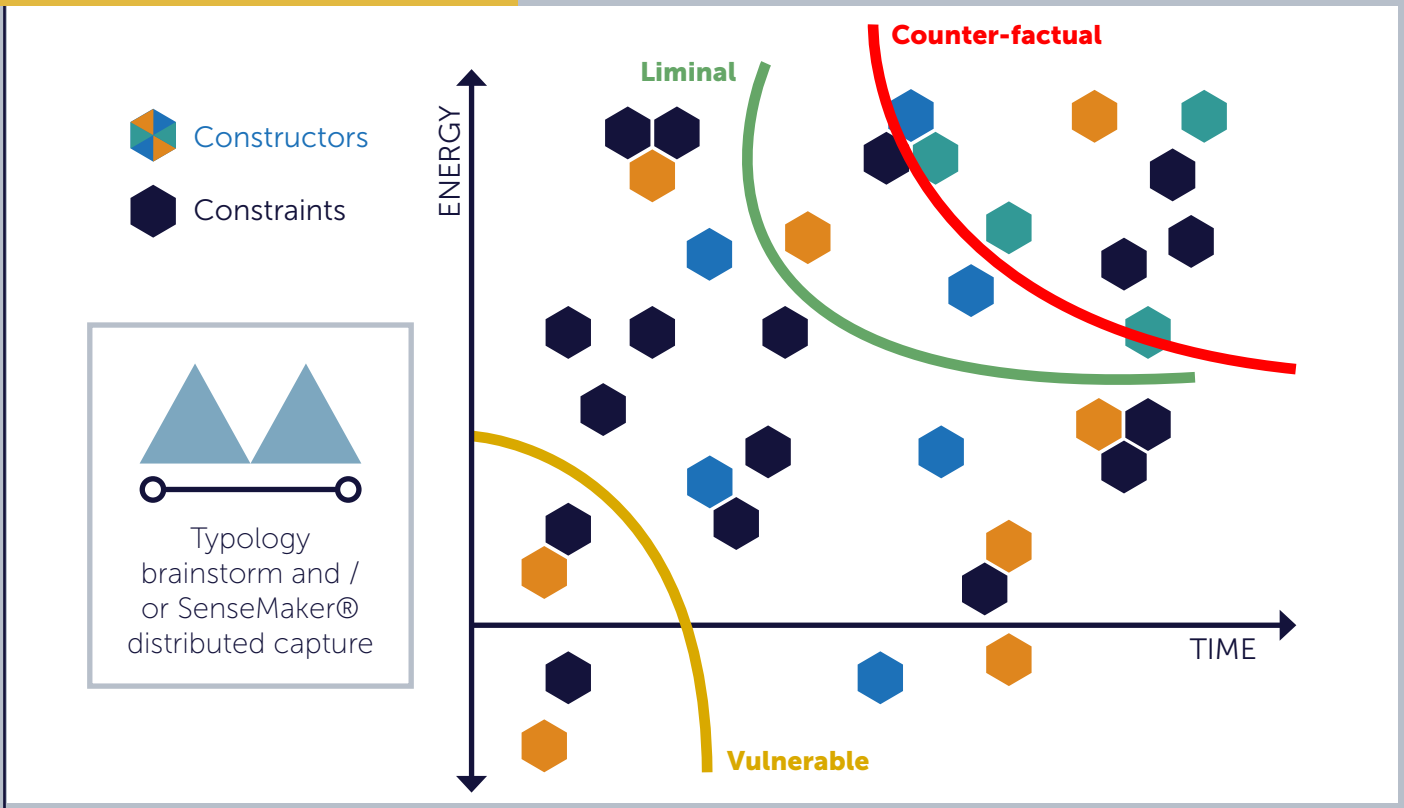
- Understanding where we are, and starting journeys with a sense of direction rather than abstract goals.
- Understanding, and working with propensities and dispositions, managing both so that the things you desire have a lower energy cost than the things you don't.
- Initiating and monitoring micro-nudges, lots of small projects rather than one big project so that success and failure are both (non-ironically) opportunities.

- You want to map at a level of granularity at which you can actually use the data to see patterns. On this map, you should plot constraints and constructors. Constraints are not things you remove to increase flow – they are necessary, they can connect or contain, enable or govern. Constructors are things that are present in a system that if something goes in, something is reliably produced (i.e. machinery, rituals that cause peoples' identity switches). For example, people have to physically stand up to present at the front of the room, undergoing a transition from spectator to facilitator.

- You should end up mapping out several key sections:
  - Top right – Known as the **counter-factual border**, it indicates that everything above the line is currently considered, for practical purposes, unchangeable – we will have to work with it as it stands.
  - A line slightly in from top right – If debate around the placement of constraints and the drawing of the border is not progressing, a **liminal boundary** can indicate the area where constraints might be counterfactuals, but aren't quite immovable. It may also cover things that would fall under the statement, *"I can't change it but someone else might be able to."*
  - Between the above and the below – people can change the current state of these issues using microinterventions.
  - Bottom left – **vulnerability**, low impact but can be changed very quickly. In this area, the constraints require the least amount of energy and time to change. Change that is too easy and too quick is instead taken as a sign of volatility and a possible warning. You should aim to stabilise them towards a more controllable pace of change or contain them.

More details on estuarine mapping, here.

ESTUARINE FRAMEWORK



BETTER DECISIONS: MAKING SENSE OF COMPLEXITY

DISTRIBUTED DECISION MAKING

- Processes within a complex system need to flexible. In line with the idea of 'collective leadership', organisations can use distributed decision making to build agility and flexibility into their processes. But how do you ensure that decision makers are aligned?
- Story mapping can help to create direction, by collecting stories and identifying a desire to increase one kind of story and decrease another. Even if people disagree on concrete goals, they may agree over story mapping. This can manifest as smaller shifts in line with a relevant direction, otherwise known as 'micronudging'.
  - For example, in the US Army, they wanted real time updates in the field. So, they introduced a new rule that if your patrol records are up to date, you don't have to write a full report at the end of the day. Reducing the energy consumption of the task required led to very high levels compliance from staff.
- Another way to distribute decision making at lower levels is to join together decision makers from across different functions or disciplines. 'Entangled trios' should consist of a young/new member of the company, an older/retiring member, and an aspiring leader who is being actively developed. Younger employees (especially those from different disciplines) learn more from informal discussions and older employees won't feel threatened by their involvement and aspirations. This also increases informal networking and connectivity.
- If you are finding that 'rules' need to be broken on a regular basis to keep day-to-day business going, they need to be replaced by a process. One engineering company solved this by saying that any rule could be broken if 3 engineers from different disciplines agreed it should be broken and could justify why.
- It is important to remember that you can't change people's 'mindset' or 'mental models'. Instead, Snowden's model asserts that you should focus on what you can change, which are things like Agency (what level of decision making do you have access to); Affordance (what is afforded to you within the process); and Assemblage (your ability to make connections between existing items to create narratives).

WATCH THE ONLINE EVENT

BETTER DECISIONS: MAKING SENSE OF COMPLEXITY

Q How do we deal with leaders who see approaches that embrace uncertainty as a threat?

A *People fall back to authority when they don't have tools or don't understand them. Giving them an intuitive framework and presenting new information or presenting the information in a new way opens up possibilities. Link those leaders into enmeshed trios as part of leadership training. Also, focus entirely on what will help senior middle managers, which will make more of a difference at the top.*

Q Explicit values create the issues you identified, but international companies need to disseminate values somehow. How do we handle this paradox?

A

- *Use anecdotes and teaching stories from executives instead, particularly ones which show what you don't want to happen. Don't spell out the message, use the oral tradition. You can also use comparatives or guiding principles – 'more like this', 'less like this'.*
- *Try to enable more peer-to-peer conversation. You can see what values are manifesting in peoples' day to day lives.*
- *Stories have huge necessary ambiguities, which is very helpful. Look at the bible or at the Good Samaritan experiment people use.*
- *Also, change the interactions they're having – for example encouraging the development of informal links across organisational silos.*

GLOSSARY (more here)

Ambiguity. The quality of being open to more than one meaning or interpretation, which can also create a kind of liminality as one transitions back and forth between meanings or interpretations. In the Cynefin framework, this most commonly describes when an organisation moves repeatedly between being a 'complex' system and a 'complicated' one. This involves testing new changes, moving between states, and allowing for changes in practice.

Bias. A disproportionate weight in favor of or against an idea or thing, usually in a way that is closed-minded, prejudicial, or unfair. Biases can be innate or learned.

Causal factor. An event or condition in the process sequence necessary and sufficient to produce or contribute to an unwanted result.

Constraint. Anything limiting the space of future possibilities or favoring its evolution in a certain direction.

Constructor. Anything that is present in a system that if something goes in, something is reliably produced (i.e. machinery, rituals that cause peoples' identity switches). For example, people have to physically stand up to present at the front of the room, undergoing a transition from spectator to facilitator.

Emergent process. A non-routine business processes whose execution is guided by the knowledge that emerges during a process instance.

Epistemology. Branch of philosophy concerned with knowledge.

Exaptive. The taking of an idea, concept, tool, method, framework, etc., intended to address one thing, and using it to address a different thing, often in another domain.

Heuristic. Rule of thumb used to speed up decision-making, the (non) application of which can be easily verified.

Liminality. The temporary transitional state between two identities. Also metaphorically used to indicate the phase transition state between any two of the primary Cynefin domains.

Novel. Different from anything known or existing before, possibly resulting from exaptation.

Ontology. The branch of philosophy that studies concepts such as existence, being, becoming, and reality.

Taxonomy. A classification based on pre-determined categories.

Typology. A descriptive characterisation of something, based on multiple perspectives.

These Post Meeting Notes were prepared by Molly Bolding, Research Executive at CRF

FURTHER READING

Cynefin.io Wiki. https://cynefin.io/wiki/Main_Page

CRF. 2022. ***Making a Paradigm Shift in Leadership Development.*** Research Report. https://www.crforum.co.uk/research-and-resources/research-making-a-paradigm-shift-in-leadership-development

Publications Office of the European Union. 2021. ***Managing Complexity (and Chaos) in Times of Crisis. A Field Guide for Decision Makers Inspired by the Cynefin Framework. Field Guide.*** https://publications.jrc.ec.europa.eu/repository/handle/JRC123629

If you would like to volunteer to work with other organisations on Cynefin-related projects, please email melissa@crforum.co.uk.

crf UPCOMING EVENTS

IN-PERSON and ONLINE:
Strong Foundations: Evidence-Based HR
18th May, 9.00 GMT, Central London
14th June, 15.00 CEST, Online

Register →

crf learning

ON DEMAND:
Organisation Analysis and Diagnosis

Course completed at your own pace, in your own space

The essential first step in any project is to define clearly the problem to be solved (or the structure to be created) and then diagnose the causes behind the problem and set objectives for the assignment. This course will enable you to do this, covering the range of practical assignments that you might encounter. Completion of this course, will provide the confidence to discuss at any level in the organisation how it can become more effective in delivering its mission.